U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services

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WATERFOWL STATUS REPORT 1965

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in collaboration with

DIVISION OF WILDLIFE RESEARCH

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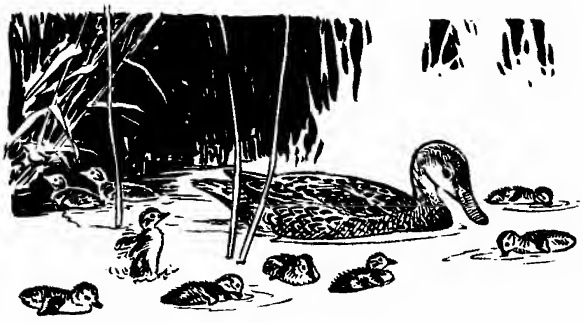

WATERFOWL STATUS REPORT 1965

The 1965 waterfowl hunting regulations were developed from four broad, closely related categories of information as herein reported. The groups of data are organized by flyways, from Pacific to Atlantic, with appendixes of tables to correspond.

Credit has been given to each individual or organization that submitted a report. Although many of the narrative statements have been briefed, and a few tables deleted or shortened if they contained data submitted previously or in another form, the essential information from each report has been retained to the greatest extent possible.

WINTER SURVEY

Figures in tables A-1 and A-2 summarize the waterfowl observed during an extensive survey of winter habitat. Most of the Stateside survey was completed by January 10, and the Mexican surveys were extended until January 25, 1965.

A comparison with previous survey results is not feasible because of the widely divergent habitat conditions in different years and a lack of comparable visual coverage in many areas. Under the best of conditions the winter survey is not an accurate measure of annual waterfowl population changes, because of yearly differences in visibility, major shifting of populations from one habitat type to another, changes in observers, variations in weather, and other factors. This year, for instance, much of the Pacific Flyway experienced flood conditions which coincided with severe winter in another area of the Flyway at the time of the January survey. This combination of weather caused a typical distribution of birds and visibility conditions not encountered in previous surveys. In the southern end of the Atlantic and Mississippi Flyways heavy rains flooded most of the hardwood river bottoms. These conditions induced a dispersion of waterfowl into habitat where accurate observation was

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impossible. At the other extreme, there was exceptionally low water in the Laguna Madre along the Texas and Mexican coasts. There was a major decline in the number of scaup and redheads normally seen in this area, but the survey was not extensive enough to determine if they were present in some other area.

Only for a few species and for a few discrete populations is the winter survey used to help measure annual population status. The best information for setting of annual hunting regulations is derived from a survey of waterfowl populations in the spring and summer on the nesting grounds. The annual January survey is used primarily to determine distribution of waterfowl on the wintering grounds and to detect major changes in the condition of winter habitat as measured by the comparative utilization of that habitat by waterfowl.

BREEDING GROUND SURVEYS

ALASKA

Data supplied by James G. King and Clinton Lostetter, Bureau of Sport Fisheries and Wildlife

Weather and habitat conditions

An extended thaw in March melted and evaporated most of the snow in interior Alaska. April brought freezing temperatures again. Thawing weather predominated in May but really warm weather did not occur until June. Ice breakups in the Tanana and Kuskokwim Rivers were 2 and 5 days later than the long-term average, respectively, compared to breakup 14 and 21 days later than average in 1964.

As a result of the March thaw there was very little runoff water and there was very little flooding of river valleys. The ponds and lakes did not receive the melt water which normally raises the ice, breaks it loose from the banks and permits the wind to churn it about hastening its destruction. The breeding pair survey was delayed while the ice melted. Although the ice in many of the lakes persisted later than usual and the weather was cool, there was sufficient open water for the ducks to disperse on schedule. Once dispersed, instead of finding the usual soggy or flooded habitat conditions the birds found relatively dry conditions so nesting could proceed at once. Thus, although the phenology of the vegetation is slightly later than normal we may find that bird production is right on schedule or early in many areas. The combination of near normal weather with the unusual lack of flooding in any area may permit very favorable nesting conditions and high production.

A hint as to what duck production will be can be gained by observations of geese and swans on the Copper River Delta, the Yukon Delta and the Kenai Peninsula. Greater nest density and larger clutches than during the past several years was reported from each of these areas.

Breeding population indexes

Tables B-1 and B-2 indicate a decline in breeding population, especially for scaup and pintail which make up the bulk of birds observed in the survey. The slight increase in widgeon which are never observed in great abundance may be caused by change in observer this year. The increase in teal may be the result of the same causes, however, production studies in 1964 indicate that teal did better in some areas than most other species., The increase shown for canvasbacks likewise may not be real as the sample is small. The decrease in mallards on the other hand may not be

as severe as the survey indicates as they had fair production in 1964 in some areas.

Production indexes

An indication of duck production was gained from the Tetlin study area surveyed July 10-12 and from seven plots on the Yukon Flats surveyed July 13-19 (table B-3). The Tetlin survey was conducted a week earlier than last year which may account for a small part of the decrease in broods. The figures from the Yukon Flats are representative of a much larger area and a wider range of habitat. Brood sizes averaged 7.4 for 60 broods on the Yukon Flats and 7.6 for 30 broods at Tetlin. Canvasback seem to be slowly increasing. Scaup were not all hatched at the time of the survey, but the indications are that they may do fairly well. The continued decline of pintails is most obvious.

Cackling goose and black brant production on the Yukon Delta was mediocre. Unusual weather and a shift in the nesting pattern made it impossible to get comparative nesting data for brant this year. However, 0.6 brants nests per acre were recorded in some areas. This is the highest brant nesting density recorded from this area. The dusky Canada goose nested in great abundance but suffered heavy mammalian predation. Predators evidently have much better access to the Copper Delta since it was uplifted by the 1964 earthquake. There were 30 trumpeter swan nests found on the Kenai compared to an 8-year average of 23 nests. Whistling swan production also seems to be up.

It would seem that the fall flight of waterfowl could be similar to the 1964 flight in all species except pintails which are obviously down in numbers. Young birds will make up a much greater percentage of the fall population than they did last year.

NORTHERN ALBERTA, NORTHEASTERN BRITISH COLUMBIA. NORTHWEST TERRITORIES AND THE YUKON

Data supplied by Robert H. Smith and Edward G. Wellein, Bureau of Sport Fisheries and Wildlife

Weather and habitat conditions

Surface water was plentiful and continued to improve both in area and levels over the most southernly stratum since 1964. To the north the country becomes progressively drier--from about 60° north latitude on the lake and stream levels were the lowest observed in several years. Except for the Slave River parklands, where many ponds and sloughs become dry, numbers of ponds and lakes throughout the north remain unchanged. The lower water levels probably provide habitat because of the wider margins exposed.

The Athabaska and Mackenzie Deltas were in better condition than during the same period in 1964. Both were flooded in their lowest portions, a normal situation following breakup, but not enough to interfere with waterfowl nesting.

The surface water situation reflects the past winter's snow cover, heavy in the south and light in the north. However, an extremely cold winter coupled with the light snow mantle produced a thickness of ice that will take a long time melting, particularly on the big, deep lakes. In spite of this there was enough open water during the time of the survey to accommodate the breeding duck population of the area.

Throughout the survey period the weather was stormy and unsettled. It rained frequently and snowed occasionally. On June 6 the area around Ft. Smith was covered with new snow and temperatures dropped low enough to freeze garden crops. Any duck nests hatching at this time could have been adversely affected.

Breeding populations indexes

The overall duck population decreased 21 percent from that of 1964. All species decreased except buffleheads, mergansers, gadwall, and ring-necked ducks.

Gadwall occur only in the most southern stratum and are numerically unimportant in the area. Buffleheads and ring-necked ducks are regular northern breeders in the area south of the Arctic Circle, and mergansers are common breeders throughout the survey area. There is no explanation for these apparent discrepancies. The fact that four species out of a total of seventeen increased, representing only slightly more than one-tenth of the total population does not materially change the overall downward trend of ducks in general. The largest decreases were noted in scoters, mallards, baldpate, shovelers, green-winged teal, canvasback, blue-winged teal, oldsquaw, redheads, and ruddy ducks. Like the gadwall, ruddy ducks, redheads, blue-winged teal, and canvasbacks are numerically unimportant in the area.

All strata registered decreases in total duck populations except the Athabaska and Mackenzie Deltas, the Precambrain Edge, and the Upland Tundra. These four together represent less than one-twentieth of the total area, and even though these are premium habitat they are not of great enough magnitude to change the overall picture.

Coots decreased considerably but are insignificant numerically in the area. Canada geese decreased 15 percent and swans increased 15 percent. Twice as many white-fronted geese were recorded than in 1964. However, we consider all goose figures unreliable as the sampling plan is geared to ducks rather than geese.

Table B-4 gives a species and area breakdown compared with 1964.

SOUTHERN ALBERTA

Data supplied by K. Duane Norman and G. Hortin Jensen, Bureau of Sport Fisheries and Wildlife

Weather and habitat conditions

Drought conditions have been extant over southern Alberta for approximately half a decade. It has been widespread and persistent and only the northern parklands were excluded. Lasting recovery from these adverse weather patterns cannot be complete in a given year but must await a succession of years where each shows an improvement over the previous year. Anything less is seasonal and inconsequential.

The snowfall during the preceding winter was the second heaviest (88.7 inches) on record with a maximum of 21 inches of snow pack. Because of this large accumulation of snow, this year gave an excellent spring runoff into the potholes. The result raised water levels in existing potholes, recreated dry potholes, and even produced new ones that were nonexistent in the past 20 years. Sheet water was common.

Current spring temperature conditions have been colder than normal with many nights being near freezing. Precipitation has not been excessive but it was cold enough to have intermittent rain and snow during the month of May. Severe winds of approximately 80 miles an hour were recorded in south-central Alberta during mid-May. Consequently, the spring season was characterized as cool and delayed. Conditions have favored economy of water. Pothole water levels have remained constant or increased during the survey period.

The numbers of potholes have generally increased from last year with the greatest increase in the northern half of the survey area. Stratum A is average; stratum B is 27 percent above average; stratum C is 4 percent above average; and conditions in the southern half of the Province are 16 percent above normal.

These reflect large increases from last year. Stratum A increased 94 percent from last year and stratum B increased 74 percent. Stratum C showed a decrease of 9 percent from 1964, and stratum C had a significant increase in pothole numbers in 1964. The Provincial index increased 60 percent above 1964 (table B-5).

The quality of these potholes is conditioned by two primary factors: (1) water depth, and (2) existing cover. With low levels or nonexistent water from previous years the water level in potholes this year would be expected to be low and vulnerable to the vicissitudes of the season. Unless summer seasonal rains occur in good quantity we can expect to lose more potholes than normally. This is especially true in strata A and C.

During the dry years the use of power machinery in farming practices has resulted in the modification of many potholes by removing the existing cover and plowing previously submerged bottoms. Little habitat was sacred and most of it was affected to some degree.

Although good runoff has reconstituted many potholes they will be of low quality to waterfowl because of the ephemeral nature of the water and lack of adequate nesting cover. Several years are required to return these droughted areas to optimum waterfowl production. Until this occurs the parklands and associated moraines constitute the habitat most likely to sustain our waterfowl production.

Breeding population indexes

Reduced indexes, in the range of 40 percent, are reflected in all species, except the pintail, both in respect to long-term averages and in comparison to 1964, (tables B-6 and 7). Paradoxically the pintail, the species which suffered the most drastic population losses because of drought, increased in numbers and was 23 percent above last year. The pintail is still well below long-term averages.

The coot index, though improved last year, has followed the pattern this year of the ducks and shows a 47 percent decrease from 1964 and a 44 percent decrease from average. With improved water conditions one would expect coots to increase. Coots are found only in potholes which will persist throughout the summer. This is another evidence of the low quality of existing habitat. Parkland populations continue to sustain the greatest proportion of coot populations.

From observed evidence mallards and pintails were beginning to nest in early May. The strength of this nesting effort will be reflected by July production. Mallard lone drake index of 82 percent appears to be normal when compared to previous years. However, the pintail lone drake index of 75 percent is low when compared to previous years. Weather conditions, though not critical for nesting waterfowl, were such that continued cool weather with intermittent rain or snow could depress or delay normal nesting activity or early nesting mallards and pintails. Observations have confirmed an influx of birds later in May. This increase was only partially recorded in survey data. It is possible that this increase could raise indexes to a more comparable position with last year, but still not equal to average numbers.

To a greater extent than usual the relative production from this year's breeding population will largely determine the success or failure of this waterfowl season.

Waterfowl production indexes

There was a 52 percent reduction in observed broods from average and a 43 percent reduction from last year. Profuse growth within the pothole basins may have served to negatively bias observed broods during this survey.

Coot indexes increased 50 percent over last season, but they are still 40 percent below average. Of note is the

fact that they were much more widespread than during the past few years.

It is a good sign to see ruddy ducks once again as breeders. During the drought they were nearly nonexistant.

The return of coots and ruddy ducks attest to the fact that habitat is truly returning to a better condition (table B-8).

While the late nesting index was difficult to evaluate correctly, it indicated more breeding pairs remained on the breeding grounds later this year. The late nesting index was increased 527 percent from 1964 and 188 percent above average (1956-65). Later nesting and renesting are not as effective as initial nesting. We will realize some later broods from these later nestings. Observations of number I broods indicated were still hatching late in July and early August. They will, however, not be sufficient to raise this year's production to average values.

WASHINGTON

Data submitted by Robert G. Jeffery
Washington Department of Game

Weather and habitat conditions

The drying trend of the past 6 years in the scabland potholes of the State was broken, to some extent, in 1965. Scabland transects included 231 potholes and lakes in May, which was a 34 percent improvement over May 1964. This was still less than half the potential number of water bodies.

The spring and early summer were fairly dry, with about normal temperatures. Soil moisture was adequate for good nesting cover development in the more arid sections. Generally, the weather was favorable for waterfowl production throughout the State.

Breeding population indexes

In 1965, there were 146,000 adult ducks on the breeding grounds of Washington. This was 20 percent below the breeding potential of 1964, and 42 percent below that of 1962. Mallard pairs were down 18 percent, blue-winged and cinnamon teal were down 30 percent and all dabblers were off 23 percent. Diving duck pairs were down only 8 percent. The deficiency in duck breeding potential was most pronounced in the pothole areas and on the irrigated lands of south-central Washington. The Columbia Basin, as well as most of the poorer duck breeding habitat, was better supplied with breeders.

Production indexes

The estimates of young duck production are based upon one, and in some cases two, follow-up counts of broods on the breeding pair transects. No breeding pair count is made in western Washington, total production being calculated from three coverages of a portion of the brood transects. For all areas adult-young ratios are derived by comparing current data with long-term averages, which, it is assumed, represent average nesting success values.

Results of the production survey are summarized in table B-9. All population figures represent young plus adults at the end of the production season.

The State production index of 403,400 ducks is 4 percent below that of 1964 (422,000). The juvenile element of the index is 257,000; this is 64 percent of the whole and indicates the highest productivity since 1961. Nesting success was comparatively high in all areas, but the scabland potholes were the only major habitat type in which increased breeding success offset the serious lack of breeding pairs.

The Canada goose production index increased by 11 percent from the 1964 level, in spite of poor nesting success on some sections of the Snake and Columbia Rivers. The tub-nesting population of geese on the Okanogan River continues to increase, and the geese using the Columbia Basin lakes and reservoirs showed a small gain.

Coots also responded to improved conditions and registered an 81 percent increase. The 1965 coot production index was 52,800.

OREGON

Data supplied by Chester E. Kebbe
Oregon State Game Commission

Weather and habitat conditions

Snow and heavy rains during the winter resulted in some of the most disastrous floods in Oregon's history. This large amount of water served one useful purpose, however, in filling most of the lakes, potholes, and reservoirs in the State to capacity, creating a large amount of productive waterfowl habitat. Malheur Lake, Summer Lake, lakes in Warner Valley, and other eastern Oregon lakes now hold more water than they have had in August in recent years.

A cold, wet spring prevented rapid evaporation and stabilized water levels in the newly created ponds.

Production indexes

Duck production on the permanent water areas continues to decline. This decline is perhaps because of a decrease in breeding ducks as well as dispersal of birds to new territories.

Production on established transects was down 37 percent from 1964. However, on Malheur Refuge, the major production area in the State, duck production was up 12 percent from 1964 and up 18 percent from the previous 10-year average. The Malheur production is estimated to be 35,000 birds as compared with 31,325 in 1964 (tables B-10 and 11).

Goose production trends on 15 permanent transect samples show a decline of 21 percent from the peak production in 1964, but down only 10 percent from the 1962-64 average. Much of this measured loss was because of dispersal of breeding birds from permanent water areas to newly created habitat. However, for unknown reasons, many paired geese failed to bring off broods (table B-12).

A phenomenal increase in coot production was recorded in newly flooded areas in the Malheur Refuge. Over 50,000 coots were produced as compared with 25,000 in 1964.

CALIFORNIA

Data supplied by J. R. LeDonne, F. M. Kozlik, Harry George, William Anderson, and Ed. J. O'Neill

Weather and habitat conditions

Water conditions in northeastern California were good this year. Most of the permanent water impoundments and marshes were full or nearly filled to capacity and provided good nesting conditions. In addition, some marginal waterfowl habitat not covered by this survey had ample water this year to produce birds. Rainfall and snow pack was normal or above normal in all areas. Rains occurred throughout June, adding to or maintaining good water levels. In summation, water conditions were good but the nesting season was late because of weather conditions.

The Central Valley received normal amounts of rainfall, although more important to production was the weather and rain during a given period which affects farming operations. This area is mostly composed of artificial and regulated water impoundments such as rice fields, grasslands and pasture areas. The rice and associated vegetation was a week or two later than 1964 due to cool and wet weather that occurred in April, May, and June.

The months of February and March were mild and dry, and migration began early. During April, rains created ideal habitat conditions for the birds on their northern migration. By the end of April most of the birds had left the wintering grounds.

Most of the waterfowl production occurring in California was found in northeastern California and on the rice lands of the Sacramento Valley. Other areas covered by this survey are: the Suisun Marsh, the Grasslands, and rice and pasture areas of the Central San Joaquin Valley. Other smaller areas produce some ducks, but the accumulated total is of little significance.

Breeding population and production indexes

Comparable figures of nesting pairs and fall population of waterfowl are presented in tables B-13 and 14.

NEVADA

Data supplied by C. V. Oglesby
Nevada Fish and Game Department

Weather and habitat conditions

Winter came early this year in Nevada, bringing large amounts of snow in the higher elevations throughout the northern portions of the State by mid-December. A warming trend occurred with rain on snow during the last week in December resulting in unseasonably heavy runoff and some flooding in western Nevada. Snowfall during January was sufficient to offset deficiencies in February and March, and the April 1 snow pack along most of the east slope Sierra was 125 percent of average.

Heavy runoff continued throughout late winter and early spring, resulting in an early fill of storage reservoirs. As of April 1, Nevada's principal reservoirs held more stored water than any time since 1959. A good carry-over of stored water into the 1966 water year is anticipated. April-July streamflow forecasts throughout major waterfowl production areas were expected to range from 94 to 158 percent of average.

Water has been restored in all production areas to normal levels or above. Marsh vegetation is showing excellent recovery from the recent drought and nesting habitat is considerably improved over last year. Some flooding of goose nests occurred in western Nevada due to the early filling of most reservoirs. Streams remained unusually high during June and July and nest loss due to flooding is expected in ducks nesting along stream courses.

Above normal rainfall and subnormal temperatures persisted throughout late spring and early summer and it appears, judging from the abundance of class I broods recorded during July surveys, that the nesting season was exceptionally late.

Breeding population index

The May duck breeding population index, as determined by aerial surveys on sample areas, showed an overall increase of 30 percent over 1964. Comparable habitat sampled amounted to 316 square miles. A total of 8,652 duck pairs was recorded this year and represents 27 nesting pairs per square mile of habitat sampled. Dabblers were up 31 percent overall with significant increases occurring in pintails, cinnamon teal, and gadwalls. The diving group was up 35 percent in the aggregate with a significant increase in the redhead breeding population (up 65 percent). The Canada goose breeding population was up 20 percent over 1964 (table B-15 and 16).

Production indexes

Results of brood surveys on comparable trend areas indicate an increase in duck production over 1964 of 13 percent. Comparable habitat sampled in 1964 and 1965 was 114.5 square miles. There were 8.3 broods and 59 ducklings observed this year per square mile of habitat. Increased production was noted in gadwalls and redheads (up 26 and 35 percent respectively) whereas cinnamon

teal and ruddy ducks were down somewhat from 1964. There was no significant change in mallard and pintail production. Canada goose production showed a slight increase over 1964.

The abundance of class 1 duck broods observed during late July surveys (25 percent of all broods classified) would indicate an exceptionally late nesting season extending well into August. Considering this, plus the fact that water and habitat conditions are expected to remain good throughout the entire summer, it would appear that the increase in duck production will be much greater than the 13 percent increase indicated on the basis of July surveys.

UTAH

Data supplied by John E. Nagel
Utah Department of Fish and Game

Weather and habitat conditions

The winter of 1964-65 provided Utah with above average amounts of precipitation. Consequently, marsh areas (both managed and natural) were in excellent condition when spring migrants arrived. Rains were prevalent throughout the breeding period, and conditions for breeding waterfowl were excellent. Extended periods of precipitation and low temperatures common throughout the spring of 1964 were absent, and some recovery from 1964 low production levels was noted on all censused areas.

All irrigation and storage reservoirs were at full capacity early in the spring. This coupled with heavy spring runoffs resulted in excellent water conditions throughout the State. This condition is expected to continue into late summer, and should result in good water supplies on all marsh areas throughout the summer and into the fall.

Breeding population and production indexes

Aerial surveys indicate a slight decrease in numbers of breeding ducks in usual high production areas; however, this is considered to be the result of increased habitat rather than a decrease in numbers of breeding waterfowl. Areas of mediocre habitat, which were enhanced by heavy precipitation and runoff, showed substantial increases in use by breeding ducks. The 5,901 ducks censused in 1965 is well above the 10-year average of 4,924 and an increase of over 300 birds from 1964 census figures.

Ground counts conducted on all Management Areas showed decreases in breeding birds. Again this is considered to be a reflection of increased breeding habitat across the State rather than a decrease in breeding populations (table B-17).

No major shift in species composition of breeding ducks was noted on northern Utah census areas. A continued reduction in the proportion of breeding divers was again noted in southern trend areas. As in past years, this "slack" on these marsh areas was taken up by green-winged teal (table B-18).

Canada geese brood counts made during the spring of 1965 indicate somewhat improved breeding conditions as compared to the abnormally cold wet spring of 1964. All State-controlled Waterfowl Management Areas, Bear River Migratory Bird Refuge, and many southern Utah production areas showed an increase in breeding pairs and gosling production; however, all areas were below 1963 production levels.

Goose production in Rich County appears to be slightly below the 1964 level. The winter of 1964-65 was extremely severe, and most haystacks along the Bear River were utilized completely by livestock during the winter. In past years, breeding geese utilized these haystacks as nesting platforms. This year geese were forced to nest in pastures and willow clumps along the river. Many of these ground nests were destroyed by skunks, and to a degree this may account for a portion of the area's reduced goose production (table B-19).

IDAHO

Data supplied by Elwood G. Bizeau
Idaho Fish and Game Department

Weather and habitat conditions

Idaho water conditions at the start of the production season were never better. All reservoirs were brim full, rivers were running high but mostly under control, all temporary water areas were full and a large snow pack remained in the mountains.

The phenology of the nesting season was about normal, except that the hatches above 6,000 feet elevation were a few days later than normal.

Flooding occurred on the Payette River in southwestern Idaho and on Dingle Marsh in southeastern Idaho. In both cases the flooding took a good bite out of goose production for those areas, but elsewhere flooding losses were remarkably low considering the high potential posed by the heavy snow pack.

Breeding population indexes

Total geese counted for all units combined was down slightly (minus 2 percent) from 1964 but far above the long-term average. The important Dingle Marsh area, an up and down goose unit, was up again, recording a 21 percent increase over last year (table B-20).

Production indexes

For all Idaho units combined, gosling production was down 9 percent from 1964 but right on the long-term average (table B-21). Gosling production for the resident goose flocks of southwestern Idaho was down 18 percent from 1964 but still 5 percent above the long-term average. Flooding caught the tail end of the goose hatch on the Payette River to cut production.

For the largely migratory goose flocks of southeastern Idaho, production was up 24 percent from the poor year of 1964 and was 7 percent below the long-term mean. A July aerial brood survey conducted for the first time on Dingle Marsh indicated a probable 25 to 50 percent goose production loss based on comparison with indicated pairs seen there in early May. Water level on Dingle Marsh was raised substantially this year by the Utah Power and Light Company during the peak period for goose nesting.

Duck production trend routes indicated a top-notch duck production year. The Blackfoot Reservoir brood route yielded the highest number of broods recorded for that area to date (table B-22).

General observations throughout southern Idaho indicated a very good production year for ducks.

SOUTHERN SASKATCHEWAN

Data supplied by John B. Millar
Canadian Wildlife Service

Surface water conditions

Spring runoff in Saskatchewan was later in 1965 than in 1964 by three days to two weeks or more. Timing of the annual survey of water conditions was correspondingly delayed in some areas. As an indication of the lateness of the season snow drifts were still observed in shelter belts in even the most southerly areas on May 1st. Survey routes changed slightly in 1965 but the same general areas (stratum A West, northwest corner of stratum A East and the central and southwestern portions of stratum B) were covered. Highway observations refer largely to type 2 wetlands (shallow fresh marshes) since that type of water area is most common close to the roads and can most readily be assessed.

Precipitation during the winter of 1963-64 was below normal in all areas (70-94%) and the effectiveness of this moisture was further reduced by losses

due to Chinooks and percolation into the soil as a result of a poor frost seal. This combination of circumstances produced the very poor surface water conditions in the grassland region of the Province in 1964. Summer precipitation did nothing to alleviate the situation as total moisture for the period April 1 to October 31 ranged from 71 percent to 104 percent of normal with the heaviest rains occurring in the fall. Water conditions in both grassland and parkland regions deteriorated by freezeup in 1964 to the lowest point since Ducks Unlimited studies began in 1962. Heavy rains in September 1964 coupled with a hard frost before the first snowfall produced a good frost seal in most areas for the winter of 1964-65. Precipitation during this period varied from 130 percent of normal at Swift Current to only 76 percent of normal at Ft. Qu'Appelle. Maximum effectiveness of this moisture was obtained in most areas however, as this was one of the coldest winters on record with no thaws of any consequence from November 1964 to mid-March of 1965.

Stratum A East (northwest corner)

Highway 6 - Raymore south to Southey. Water conditions were highly variable. Most basins were in poor condition but some cattail ponds were well filled. Sheet water was spotty.

Highway 22 - Southeast to Lipton. Water conditions were poor though there was fair sheet water in spots.

Highway 35 - Lipton to Qu'Appelle Valley and south to Highway 1. Water conditions were poor. Type 2 basins were very low and some were dry.

Ft. Qu'Appelle area (south of the valley). The effects of prolonged subnormal precipitation were very evident and spring water conditions were the worst observed in this area. Slough levels were more than six inches below those of 1964 in spite of equal runoff this spring. Sloughs which were considered in 1962 to be semipermanent will be dry this year before mid-July. This area can be writtenoff as far as waterfowl production is concerned.

Highway 1 - Qu'Appelle to Regina. Water conditions were generally poor but improved to the west.

Stratum A West

Highway 11 - Saskatoon south to Chamberlain. Slough conditions were quite good. Most type 2 areas were filled but some larger basins were below capacity. Sheet water was good.

Highway 2 - Chamberlain south to Moose Jaw. Small sloughs were well filled, larger flats were below capacity and sheet water was excellent.

Moose Jaw - Coteau area. Water conditions were highly variable but much improved over 1964. In spite of subnormal (91%) winter precipitation most small type 2 basins were in excellent condition. Larger basins, however, have shown a rather modest recovery and most semipermanent sloughs which went dry in 1964 will not survive the season without heavy summer rains.

Highway 1 - Regina to Moose Jaw. Dugouts on the Regina Plains were filled to capacity and there was a good deal of sheet water.

Highway 1 - Moose Jaw to Ernfold. Water conditions in the Missouri Coteau were generally disappointing. Some sloughs were in good condition but most were well below capacity. West of Ernfold conditions tend to improve and the Rush Lake flats were completely flooded.

Highway 39 - Moose Jaw to Corinne (Regina plains). Little slough development but dugouts were well filled.

Highway 6 - Corinne to Pangman. Little slough development but basins were in good condition.

Pangman area (Missouri Coteau). Conditions parallel those of Moose Jaw area. Small basins were in good shape but many of the larger semipermanent sloughs were in poor condition and a few were almost dry at this time. Successful waterfowl production will depend to a great extent on summer rains.

Highway 13 - Pangman to Assiniboia. Conditions were generally fair with good water in some localities.

Assiniboia to Cadillac. Water conditions appeared fairly good though difficult to assess as most marshes are some distance from the road.

Highway 4 - Cadillac to Swift Current. Slough basins, where present, were in generally good condition.

Swift Current area. Water conditions improved remarkably from the severe drought situation which existed in 1964. All sloughs were in excellent shape and semipermanent basins that were dry last fall now have from four to five feet of water.

Highway 19 - Highway 1 to Highway 15. Water conditions were generally good. Most type 2 basins were well filled and there was a fair amount of sheet water.

Highway 4 - Swift Current to Rosetown. Water conditions were excellent. North of Elrose several extremely large flats have been flooded.

Highway 7 - Rosetown to west of Kindersley. Water conditions were excellent. Brock slough is presently several hundred acres in extent.

Kindersley area. Water conditions were the best observed since the high water years of the midfifties and many of the semipermanent basins which were dry in 1964 are now secure for the current season.

Highway 30 - Kindersley to Kerrobert. Water conditions were excellent with many large flooded flats in evident.

Stratum B

Grid road - Kerrobert to Scott. Water conditions were excellent, grid road was nearly under water in several spots.

Wilkie area. Water conditions were excellent. Average slough depth was one foot greater than in 1964 and many sloughs have flooded into cropland. Back roads were under water in many localities. Brood areas were secure for this season.

Highway 14 - Scott to Biggar. Water conditions were exceptionally good, roughly comparable to those observed at Wilkie.

Biggar to Perdue. Conditions were not quite as good as farther west but still very satisfactory.

Perdue to Saskatoon. Country is sandy and water conditions were not particularly good. Most basins were below capacity.

Saskatoon area. Water levels have increased markedly (average depth was up 16.4 feet) over those of 1964 in spite of subnormal (92%) winter precipitation. The number of brood sloughs available this season will certainly be greater than for the past few years.

Highway 5 - Saskatoon to Highway 2. Most small basins were filled to capacity but larger sloughs have not improved to the same extent. Sheet water was good.

Highway 5 - Junction Highway 2 to Junction Highway 3. Water levels were good but not exceptional. Basins were not flooded beyond brush rims.

Highway 3 - Junction Highway 2 to Melfort. Conditions were generally good but not exceptional.

Melfort area. Water conditions were almost exactly the same as in 1964. Runoff was almost four inches greater than in 1964 but this gain only served to compensate for the unusually high water loss experienced in 1964.

Highway 6 - Melfort to Dafoe. Water conditions were somewhat variable but generally good.

Dafoe to Raymore. There was a moderate amount of sheet water and perhaps half the sloughs and dugouts were not filled to capacity.

Summation

Water conditions in the western part of stratum A west were excellent, while eastern half varied from good in the north to only fair in the south in the Missouri Coteau. The northwestern corner of stratum A east was in very poor condition. Stratum B ranged from excellent in the southwest to good in the central part. Stratum C was surveyed briefly in early

April (Highway 1 west to the Alberta border) before runoff was complete and conditions there appeared to be quite good.

The big question mark was the extent to which ducks were available to utilize the improved water conditions in the western part of the Province. Preliminary observations indicated that breeding populations were lower than those of 1964 in all areas and particularly in the Swift Current Study area.

SOUTHERN SASKATCHEWAN

Data supplied by Rossalius C. Hanson and Gerald Pospichal, Bureau of Sport Fisheries and Wildlife

Weather and habitat conditions

Water conditions looked good over most of the areas. The pond index was up over last year in all strata except A-East. A-East was exceptionally good last year and the decrease is not indicative of a poor condition; it only means a drop from the 1964 figure. This stratum had a few dry spots which reduced the number of ponds. It is still considered in a fair to good condition.

One noticeable feature of the water situation was the quality. Many of the ponds were only one-third to one-half full. This means a questionable existance past midsummer. However, during May there was normal to cooler temperatures with above average rainfall. If this continues the majority of the good ponds will hold up long enough for the broods to get on the wing.

The reason for the good condition of the ponds was not particularly a great increase in moisture over winter, but a good run-off period in April. Snow was adequate and had been blown into many of the dry marshes and ponds. The last half of March was one of the coolest on record and April opened with normal temperatures. Above normal rains since early April added to the depth of the ponds. More sheet water and temporary moisture spots were noted this year than in the past 4 years. The marshes looked better than they have since 1960. The pond index stands at 1,637,300. This is the best since 1960 and shows an increase of 38 percent over last year and 17 percent above the long-term average, 1956-1964 (table B-23).

Habitat has suffered from the long drought period. Many of the pond areas with fair-to-good water conditions this year are devoid of adequate vegetative cover. Much of it was mowed for hay to eliminate weeds, many depressions were completely plowed up, and considerable fall burning was evident. Fortunately, some of the more permanent marshes have persisted with old emergent acquatics still in evidence. Over-water nesters had to find cover, but apparently they were there looking because more divers were noted than last year. The upland nesters were reported using stubble and even summer fallow in areas this year where they had not been seen for the past several years. This indicates the improvement in water in dispersing the birds and may indicate inadequate pond cover. Near the end of May new vegetation was rapidly catching up and cover was becoming available for renesters and late nesting species. Cover should not be a problem as the season progresses.

Weather and temperatures were near normal during April and May except for May 26. This day proved to be a real bad one. Rain was general throughout the prairie areas and snow fell in stratums A and B-East. Along with high winds this snow formed drifts up to a foot deep in brush, ditches, and depressions. It was the worst in an area from the Quill Lakes east to the Manitoba line. Overnight temperatures on this date dropped to 23° in Prince Albert and near 30° in many prairie areas. What this did to nesting efforts is difficult to assess. It was not beneficial to birds laying or on the nest.

Breeding population indexes

Puddle ducks were down 14 percent from last year while divers increased 29

percent. Practically all the numerically important puddle ducks were down from last year, this is, mallards 20 percent, gadwall 19 percent, and shoveler 37 percent. The only one showing improvement was pintail, up 17 percent. Comparing them to the long-term averages, all were down except gadwall, which showed a plus 52 percent. These still remain down by a considerable figure when related to the average.

Coot populations increased 20 percent over last year, but still remained 68 percent below the average. They definitely followed the improvement in water conditions and probably do not reflect a true population change. It is more than likely a shift of populations to the well-watered prairie areas. The Canada goose population was unchanged, for all practical purposes, from last year (table B-24).

The lone drake index was 82 percent this year, made up of mallards, pintails, and canvasbacks. It is high enough to indicate a early nesting season but this is not borne out by the late spring weather or the early habitat conditions. However, it may be that the birds caught up as did the vegetation as the season progressed (table B-25).

Production indexes

Weather conditions apparently affected the early hatch although it was difficult to determine just what did take place. It is likely that the repeated rains did considerable damage. The extreme cold snap with snow on May 26 may have been a real blow to the early hatch. Actually, the number of class II broods was also low, indicating adverse conditions during June. However, class I broods were showing up in substantial numbers by mid-July.

The brood index this year stood at 49, 800 compared to 66, 900 a year ago and 219, 000 for the long-term average. This is 26 percent under last year and 77 percent less than the average. Brood size was good. It showed 6. 0 ducklings per brood which was 15 percent above the long-term average. Coot broods were down about 10 percent from last year but indications of nesting birds would make it appear that late success will be all right.

The extremely high late nesting index this year adds a great deal to the production outlook. This, combined with the satisfactory pond condition, does give measurable hope for a good, late hatch. This probably will be noted mainly in the middle and late nesting species. Certain renesting efforts by the early laying species will probably show only mediocre production.

The index is 152 percent above last year and 36 percent over the average. It is better than any year since 1960. The dabblers are all up with an over-all increase of 242 percent over last year and 52 percent above the average. On the other hand, divers are generally down with the exception of redheads (table B-26).

MONTANA

Data supplied by Henry A. Hansen
Bureau of Sport Fisheries and Wildlife

An operational waterfowl population survey was established for eastern Montana in May of 1965. This was patterned after J. D. Smith's 1958 experimental survey south of the Missouri River and continued north of the Missouri River in conformity with the established pattern in adjacent Alberta, Saskatchewan, and North Dakota. The aerial survey conducted by the Montana Department of Fish and Game north of the Missouri River the past few years will be replaced by the standard operation initiated in 1965.

Area and methods

Eastern Montana falls into the two natural ecological units divided by the Missouri River. These have been designated as stratum 1 (South) and 2 (North). The standard sampling plan was used with east-west transects divided into 18-mile

segments. All transects start with segment #1 on the eastern border of Montana. The transects are numbered consecutively from 1 through 12, south to north, starting at 45°30' north latitude and extending to the Canadian border. Stratum 1 40,500 square miles in extent, was sampled with 80 segments of 18 miles each. Stratum 2, 33,000 square miles, was sampled with 113 segments.

Water and habitat conditions

Following a severe winter with heavy snow, the water conditions were good to excellent. Spring was about two weeks later than normal, but having arrived, accelerated at a fast rate. The rapid appearance of lone drakes indicated that the late spring did not have an adverse affect on the progression of the nesting season. Heavy rains the first week in May completed filling many stock dams and potholes that had not been previously filled from snow melt. This rain also created much temporary sheet water in wheat stubble north of the Missouri River. These shallow ponds, which covered shattered wheat from the last harvest, were very attractive to ducks of many species, particularly pintail and mallard deserter males. Therefore, a disproportionately high percentage of ducks was counted on water that would be present no more than a week or two unless heavy rains continued.

Population indexes

Stratum 1 had a mean density of 6 ducks per square mile for a breeding population index of 256,000. Mallards comprised 67 percent, pintails 15 percent, blue-winged teal 6 percent, gadwall 4 percent, and several lesser species the remainder.

Stratum 2 had a mean density of 14 ducks per square mile for a breeding population index of 471,000. In this area pintails were most abundant, 35 percent, followed by mallard 31 percent, gadwall 13 percent, shoveler 6 percent, and blue-winged teal and widgeon 5 percent each (tables B-27 and 28).

Discussion

All water areas were recorded by the pilot within a one-eighth mile strip as to type and permanency. Four categories were designated: (1) stock dam, (2) natural pothole or lake (including temporary sheet water), (3) stream and (4) dugout. These were judged to be (a) permanent (lasting through the summer), (b) semipermanent (lasting until majority of broods are fledged) and (c) temporary (lasting no longer than mid-June). All duck use was recorded by water type and permanency (tables B-29 and 30). Each time a stream was intercepted within the survey strip it was recorded. Thus, if the same stream meandered back and forth across the transect, it was counted as often as interdicted. If a stream ran continuously within the eight-mile strip for a quarter or half mile, it was counted only once, however.

In both strata, dugouts were not numerous enough to be of great significance. The occurrence of streams is relatively the same in both areas. Stock dams in stratum 1 are almost twice as dense as they are north of the Missouri River. Conversely, potholes in stratum 2 are four times as dense as they are south of the river (table B-31).

As one would suspect, permanent potholes and lakes had a much higher preference rating by ducks than any other type of water. Semipermanent and temporary potholes south of the river were much less attractive then they were in the north stratum, however. Permanent stock dams were somewhat more attractive in the south where there were fewer bodies of water than there were in the north, but properly built stock dams throughout the range land were readily used by many species.

The ratio of stock dams to semipermanent and temporary streams in stratum 1 was roughly two to one, whereas the ratio

in stratum 2 was one to one. In other words, streams suitable for building small, simple stock dams are more completely utilized south of the Missouri River than they are north. Yet there is still adequate drainage to build an average of at least two more stock dams per each three square miles in both strata. Development of this program to its maximum would be of immediate benefit to both the livestock industry and to waterfowl.

CHIPPEWA NATIONAL FOREST, MINNESOTA

Data supplied by William J. Ellerbrock
Bureau of Sport Fisheries and Wildlife

Weather and habitat conditions

The water level reading at the Winniegigoshish Dam at the time of the census was 11.1 feet or .7 foot above normal. Water levels in all areas censused were above normal and higher than last year except for Burns Lake. This area was below normal. Beaver dams may have been controlling the levels in this area.

Summer and fall rains during 1964 combined with 56 inches of snow and about 10 inches of rainfall in May and June made an abundance of habitat available throughout the forest area.

Submergent vegetation was less abundant than the previous year except for Burns Lake. The wild rice growth was quite poor in most areas. It is anticipated that the crop will be one-half of normal or less depending upon future weather. Emergent vegetation was about normal for the area. Third River flowage continues to be choked with cattail growth which makes accurate censusing of the area practically impossible.

Breeding population indexes

The population index species composition and adult/young ratio are summarized in tables B-32, 33, and 34.

TRI-STATE AREA
(North Dakota, South Dakota, and Minnesota)

Data supplied by Glen V. Ortin and Bonar Law
Bureau of Sport Fisheries and Wildlife

Weather and habitat conditions

There was good to excellent snow cover over most of the tri-State survey area during the winter with the exception of south-central South Dakota. Heavy runoff and flooding occurred in western Minnesota and the eastern Dakotas. Heavy, wet snow fell in western South Dakota in mid-May which was followed by heavy rains. This resulted in flood conditions in that area. Heavy rains, reported to be over 12 inches, fell in Rolette and Towner counties in north-central North Dakota in mid-May. These local flooding conditions probably destroyed some early nesting attempts. Cool temperatures and light winds, along with light rains and a few thunderstorms further improved water conditions in the survey area.

The May 1965 water index was up 47 percent from 1964 and up 18 percent from the 7-year average. Total precipitation is average or above over most of the survey area. (table B-35).

Farming operations are running behind schedule in most of the tri-State area. Moisture supplies are reported to be among the best in recent years. Because of the late spring, vegetative growth was behind schedule and did not hinder aerial observations.

Breeding population indexes

Dabbling ducks showed an increase of 16 percent from 1964 and an increase of 14 percent from the 7-year average. Compared to 1964, mallards, gadwall, and shovelers showed respective increases of 17 percent, 120 percent and 5 percent. Pintails

and blue-winged teal showed respective decreases of 6 percent from 1964. The following comparisons are made to the 7-year average: Mallard +16 percent, gadwall +83 percent, shovelers +1 percent, pintails -40 percent, and blue-winged teal +30 percent. Only token numbers of American widgeon, and no green-winged teal were observed.

Divers were up 66 percent from 1964 and up 44 percent from the 7-year average. Compared to 1964, redheads and canvasback showed a respective increase of 16 percent and 38 percent. In comparison to other species the total number of ruddy ducks was small, however, they showed an increase of 200 percent from 1964. Scaup showed an increase of 580 percent from 1964. This sharp increase is because of the very low population observed in 1964 and represent only a 6 percent increase from the 7-year average. The increase in scaup undoubtedly reflects late migrants which may also have been the case with several other species.

In summary, the total duck index for the tri-State area is up 20 percent from 1964 and up 17 percent from the 7-year average. Total coot were up 108 percent from 1964 and up 40 percent from the 7-year average (table B-36.

The lone drake index of 67 percent, slightly lower than 1964 (67.6%), indicates that the nesting progress was about the same as last year.

Production indexes

The 1965 tri-State brood index shows an increase of 2 percent over 1964, although fewer broods were observed in 1965. This 2 percent increase is the result of more broods observed in the eastern and western strata which have high expansion factors and fewer broods observed in the central stratum which has a relatively low expansion factor. The brood index was down 45 percent from the average. Average brood size in 1965 was 4.9 compared to 6.0 in 1964 and an average of 5.0. Coot broods showed an increase of 35 percent from 1964 and 11 percent above the average (table B-37).

The 1965 July water index showed an increase of 19 percent from 1964 and a decrease of -4 percent from the average. Vegetative cover was not a problem until the last few days of the survey.

The late nesting index of +27 percent above the average and 44 percent above 1964 indicates considerable late nesting attempts are in progress. Dabblers, which make up 88 percent of the total population, showed an increase of 37 percent as compared to 1964. Of the dabblers, late nesting indexes for the particular species are listed as follows as compared to 1964 and the 7-year average: mallard +46 percent and 13 percent, gadwall +89 percent and 166 percent, blue-winged teal -13 percent and +20 percent. The late nesting index for divers showed an increase of 125 percent from 1964 and an increase of 4 percent from the average. Species represented were redheads and ruddy ducks. Redheads showed an increase of 68 percent from 1964 and +31 percent from the average. Ruddy ducks were up 215 percent from 1964 and +9 percent from the average.

NORTH DAKOTA

Data supplied by Charles H. Shroeder
North Dakota Game and Fish Commission

Water and habitat conditions

Water conditions in North Dakota at the time of the mid-July survey were better than they had been in 1964. The 1965 water index of 6.60 represented an increase of 22 percent over the 1964 water index of 5.42, and a 72 percent increase over the 1958-1964 average water index of 3.84.

The good water conditions that were observed during the survey were the result of good water conditions during the spring and the heavy rains received during June and early July.

The number of water areas observed along each transect and the resulting water index (water areas per square mile) are presented in table B-38.

Breeding population indexes

Many pairs of ducks were observed during the survey, especially pairs of gadwalls, redheads and blue-winged teal. A better-than-average late hatch is possible.

Production indexes

The 1965 mid-July brood index (duck broods per square mile) was 0.59. This represented a 37 percent increase over the 1964 brood index of 0.43, but a decrease of 52 percent from the 1955-1964 average brood index of 1.22. The 1961 brood index was not included in the 1955-1964 average, since the 1961 data were not comparable.

The number of duck broods observed along each transect in 1965 and the resulting brood index are presented in table B-39.

The distribution of the duck broods by age class in 1965 is presented in table B-40 along with the 1964 distribution and the 1955 through 1964 averages.

NEBRASKA

Data supplied by John T. Sweet
Nebraska Game, Forestation and Parks Commission

Weather and habitat conditions

Conditions were dry throughout the Nebraska Sandhills during the spring waterfowl migration period. The dry conditions persisted until after the breeding ground survey was made. The water index was down 49 percent from the 1964 May survey. The area began receiving good general rains about the third week of May. Water conditions in the western and west-central portions of the Sandhill breeding area were much improved from the end of May on, though general conditions were still only fair to good. Conditions in the eastern areas were only fair, at best. Good general rains did not continue to occur in many areas, so water supplies declined as the season progressed. Eastern areas were quite dry by mid-July. Many water areas in the west and central were not occupied due to lack of water during the spring migration period.

The western half of the south-central portion was completely dry at the time of the breeding ground survey. Starting in late May and continuing through the summer, above normal rains have created excellent surface water.

Weather conditions were dry and cool during the spring. Temperatures remain relatively cool up until the time of the July surveys. Only a few very hot days had been experienced. Localized rains in the western Sandhills area helped to maintain some water levels.

Breeding population indexes

The 1965 aerial breeding ground transects were flown over the Sandhills during the period May 11 through May 17. The breeding waterfowl index for the Sandhills was 57 percent below the 1964 figure and 52 percent below the previous 5-year average. The calculated breeding population for the Sandhills was 52, 895 ducks of all species. All species except mallards and gadwalls indicated decreases in their percent of the species composition.

The breeding population in the south-central area was calculated at 8,140 compared to 12,530 in 1964. Statewide the breeding population index was down 56 percent (table B-41).

Production indexes

Aerial brood transects were flown over the Sandhills breeding area during the period July 12 through July 21, 1965. The south-central area was not flown again this year.

A total of 24 broods was observed on the July aerial survey. Good counts were made on all 24 broods which had a total of 123 ducklings. The total number of broods sighted was down 68 percent from 1964, and the number of ducklings was down 58 percent.

Ground route indexes made through portions of the Sandhills sampled by the aerial transects indicate quite a different outlook. These indexes indicate an increase of 27 percent for broods and 26 percent for ducklings over the 1964 figures. The number of ducklings per brood from the 1965 aerial counts was 5.13, an increase of 0.45 over 1964. The average brood size from ground routes was 5.30 compared with 5.31 last year.

The hatch appears to be quite irregular with the peak hatching date about three weeks later than the 2 previous years. New broods have been appearing during the third and fourth full weeks of July. According to aerial surveys, 16 percent of the ducklings sighted were class I, 41 percent were class II, and 43 percent were class III. Ground counts indicated that the percentages were 45, 36 and 19 respectively for the classes I, II and III.

The conflicting brood data obtained from aerial and ground surveys (aerial -68 percent decline, ground -26 percent increase) is probably partially explained by peak hatching occuring at time of aerial surveys and less observability of class I broods. (table B-42).

On the basis of the aerial data, the 1965 waterfowl production in the Nebraska Sandhills may be as much as 50 percent below that of 1964. Ground counts and a significant number of late appearing broods, however, tend to introduce some optimism. The later broods tend to be larger.

Nebraska duck production appears as though it may be only slightly less than that of 1964.

WYOMING

Data supplied by George F. Wrakestraw
Wyoming Game and Fish Commission

Weather and habitat conditions

Much of the low elevation area of the State was in a dry condition at the start of migration. On the other hand, snow pack at the higher elevations was at a record level. In early May, rain fell over much of the State and filled stockponds, reservoirs, and natural depressions to a high level. Periodic rains throughout the latter part of May and early June assured ample water for brood survival.

Runoff in most areas was mostly above normal, but only a few late nesting Canada geese were effected.

Many large groups of widgeon, as well as smaller numbers of other species, were found congregated at the end of May. The status of these birds is unknown.

Breeding population indexes

All ducks classified as being unidentified during the 1965 survey were added to those identified on a proportionate basis. All previous years were recalculated in a similar manner to provide comparative data.

The estimated duck breeding pair population for 1965 shows a 13 percent decline from 1964 and an increase of 57 percent from the 1955-1964 average. The total number of ducks observed during the 1965 survey shows an increase of 8 percent from 1964 and an increase of 67 percent over the 1955-1964 average. Many birds appeared to be nonbreeders (table B-43).

Coot and mergansers are separated from the totals and both species show

significant increases from 1964 and the long-term average.

A record number of geese were found during the survey for a 14 percent increase over 1964 and a 78 percent increase from the long-term average.

Production surveys indicated a good hatch in most areas with some loss being recorded for parts of the Green River, Snake River and North Platte River (table B-44).

COLORADO

Data supplied by William H. Rutherford
Colorado Game, Fish and Parks Department

Weather and habitat conditions

Weather conditions in Colorado during the spring and early summer were variable and probably not altogether favorable for waterfowl nesting. The high mountain snow pack was very heavy in all areas, and the spring season was generally cold and wet. Runoff was retarded, but once it started many streams reached flood proportions. Coupled with this was a continuation of heavy precipitation, with cloudbursts during June contributing to already heavy runoff. Breeding-pair surveys were conducted before streams began to rise appreciably. The unusual quantities of water in the South Platte Valley have probably adversely affected nest establishment, hatching success, and brood survival. In the Yampa Valley, it is believed that goose nesting was completed successfully before river and pond areas were flooded. In areas of the State other than the South Platte Valley, waterfowl production has not suffered from flooding. It appears that water will present in abundance in all areas of the State throughout the summer, and that broods surviving the flood have an excellent chance of surviving to the fall flight.

Breeding population index

Examination of the duck breeding-pair estimates by area (table B-45) reveal that the 1965 counts were up 1 percent from 1964 and 32 percent above the 1954-1964, 11-year average. It is obvious that Colorado is continuing to experience a year-to-year upward trend in breeding-pair numbers.

Species composition of the breeding duck population was about the same as those of past years. Blue-winged teal, green-winged teal, gadwall, shoveler, and merganser were up somewhat, with other species being either stable or slightly down. (table B-46).

In 1965, the western slope Canada goose breeding area showed a decrease in number of geese and total gosling production from the all-time high of 1964, but still substantially above the 9-year average. All nests were hatched before extreme high water occurred, and no nests are known to have been lost by flooding.

The current surveys indicate a moderately successful production year and a continuation of the excellent status of the Canada goose flock in Moffat County. Most of the highest-quality nesting habitat is now occupied, but there still remains a considerable amount of unoccupied nesting habitat of somewhat lower quality but still capable of good production. Thus, it is the management objective to continue the increase in the size of this flock (table B-47).

NORTHERN SASKATCHEWAN, NORTHERN MANITOBA AND WESTERN ONTARIO

Data supplied by Arthur R. Brazda and
Gust J. Nun
Bureau of Sport Fisheries and Wildlife

Weather and habitat conditions

Spring was slow in coming to the region north of Prince Albert, Saskatchewan, and The Pas, Manitoba. On May 22 Clearwater Lake, near The Pas, was

two-thirds covered with ice, and remnants of the past winter's snow were still evident in the more secluded coulees and gorges. Ice could also be observed on some of the larger lakes in the Flin Flon, Manitoba region. Temperatures did not fluctuate widely, but remained consistently cool -- ranging from 30° to 50°. Intermittent cold rains persisted throughout late May and early June. On May 26 snow fell over a broad area of Saskatchewan and Manitoba, depositing up to 7 inches at Thompson, Manitoba. The aftermath of this storm was still evident in northern Manitoba 3 days later. In northeastern Manitoba many of the lakes were still partially covered with ice on May 31. In the lower portions of our survey area, in Saskatchewan and Manitoba, leaf development on the aspen and willow was about one-third complete, while on the northern transects it was beginning to leaf. By the time the survey was started in Ontario on June 5, vegetative development was more pronounced, though not completed--specially in the upper extremities of the transects. Strong winds persisted throughout the survey period, as is generally the case.

Water levels were the highest they have been during the past 4 years, ranging from excellent in Saskatchewan to very high in northern Manitoba and parts of northern Ontario. In the latter areas, several small rivers were observed overflowing their banks and many small potholes were flooded well beyond the established shore lines. To what degree first nesting attempts were affected by the high water is not known. The status of one of the finest pieces of waterfowl real estate in Canada, the Saskatchewan River Delta, is in definite jeopardy. The Grand Rapids Hydro-electric Project, located at the confluence of the Saskatchewan River and Lake Winnipeg, has created one large lake out of thousands of acres of once-excellent habitat. At the time of the survey, diver habitat remained in fair amounts, while dabbler nesting areas were very limited. Canada goose habitat may have been improved in certain localities. The crux of the matter will be the ultimate pool level and the fluctuating water levels. The water appeared to be rising, and flooding of coot nests was observed.

South of The Pas, another portion of high quality Delta is being drained by a so-called land development project. Several new ditches were evident throughout the area.

The first drainage ditch of any size was observed this spring near Meadow Lake, Saskatchewan. This ditch tapped on 80 to 100-acre marsh.

Breeding population indexes

In 1964, the area north of 55°30'N in Saskatchewan was not surveyed. Deleting this data from the 1965 information and comparing the remainder with 1964, a -16 percent change in total numbers is indicated (table B-48). Comparing 1965 with 1963, the last year complete data was obtained, -14 percent is shown. In each of the areas surveyed, a slight decrease in the over-all waterfowl breeding population index is indicated. However, only in Ontario does this decrease reach proportions which demand closer surveillance. It has been the practice in past years to start the survey in Ontario near the end of May, generally completing the flights by the end of the first week in June. However, in 1965 the first Ontario transect was flown June 7 and the last, June 13. The data obtained in 1965 suggests the possibility that some transient birds were tallied previously and that a more valid breeding population index of this low quality habitat was obtained this year.

The decreases indicated for the remainder of areas surveyed were minor and suggest an almost static condition. The Saskatchewan River Delta index compared favorably with the past 5 years, as did all other areas. However, production in the Delta east of The Pas could be very low depending almost entirely on the Hydro-electric Project. The Beaver River drainage, north of Meadow Lake

and south of Waterhen Lake in Saskatchewan, was again in excellent condtion.

Canada geese numbers were up in all survey units except Ontario, and coot showed no change. The total duck population index in 1965 was 857,689 compared with 991,648 in 1963. However, all units were not completed in 1964.

The fall flight out of this portion of Canada's waterfowl habitat should be the same or slightly below that of 1964, depending on what effect the relatively cold, wet spring had on the early nesting species. For the past 2 years, water conditions have been down in lower Saskatchewan and western Manitoba. However, the dry, early nesting periods resulted in a better than average success for the first nesting attempt. This may not be the case in 1965. In Ontario, despite a sharp decrease in the population index, the stable type habitat surveyed and the area north of the range will probably produce as it has in the past.

Production index

Total duckling numbers showed a marked decrease of 412,312 in 1965, minus 64 percent. At the same time, the late nesting index was down 34,500, minus 17 percent. Ducklings were down in all areas surveyed, ranging from minus 32 percent to minus 87 percent, and only in the Saskatchewan River Delta, Manitoba D-1 and D-2, did the late nesting index show an increase; plus 141 percent (table B-49).

Class II and III broods made up 84 percent of the total compared with 98 percent in 1964. However, only 80 broods of all classes were observed in 1965, whereas 375 were observed in comparative areas in 1964. The data suggests that regardless of when the nesting attempt was made, all were about equally unsuccessful. Using comparative data, class I broods showed a minus 68 percent in 1965, class II broods - minus 82 percent, class III broods - minus 74 percent (tables B-50 and 51).

SOUTHERN MANITOBA

Data supplied by Morton M. Smith, Richard Droll, and J. D. Smith, Bureau of Sport Fisheries and Wildlife

Weather and habitat conditions

Last winter was as cold as any of this century in the Canadian prairies. May continued generally cold and wet despite one period of fine weather.

Survey flights did not begin until May 11 and were not completed until May 28, 1965. These are the latest starting and ending dates for the breeding pair survey in southern Manitoba.

Soil moisture reserves at the end of 1964 were satisfactory in Manitoba despite a dry September and October. The snow fall in Manitoba was generally good last winter and rainfall this spring has been abundant.

On May 1 the larger water areas in southern Manitoba were still frozen and snow drifts remained in sheltered areas. The season appeared to be a week or more late. A period of clear weather at mid-May allowed the vegetation to catch up fast, but cold weather in late May again slowed things down. As a result, the phenology of May 1965 was behind that of 1964. Although aspens were leafed by mid-May on sandy lands and emergents were dense in some shallow ponds, the overall screening effect of vegetation seemed less than that of 1964.

There was extensive burning of pothole margins and clearing of brush during the fall of 1964. As a result, many areas were bare this May and over-water and upland nesting cover was reduced. Many potholes in south-western Manitoba were low in early May, but this area had received substantial moisture during the month. Pond counts in stratum A this year were down 18 percent from the near record levels of 1964, but are 21 percent above the 12-year average. The number of water areas found in stratum B in 1965 was 44 percent greater than that of 1964

and 29 percent above the 12-year average. As a result, pond counts for strata A and B combined are up 10 percent over 1964 and 26 percent over the long-term average. Water conditions are good in southern Manitoba and should be adequate for such production as occurs in the survey area (table B-52).

Breeding population indexes

Breeding duck numbers continue low in southern Manitoba. The 1965 index is nearly identical to that of 1964 and is 27 percent below the average of the previous 12 years. Only in 1953 and 1962 was the index for southern Manitoba lower than that of the last 2 years.

The dabbling duck index is 6 percent below that of 1964 and 41 percent below the 12-year average. Of major concern is the continued decline in the mallard population. The 1965 mallard index is 12 percent lower than that of 1964 and 50 percent below the 12-year average. The mallard breeding pair index in southern Manitoba was about a half million birds from 1956 to 1958. The 1965 index is only 147,000.

The index for the important blue-winged teal is 14 percent lower than that of 1964 and 56 percent below the 12-year average. The pintail index increased 23 percent over 1964 but remains 31 percent below the long-term average. The surveys indicate an increase in baldpate while shoveler and gadwall numbers declined.

The diving duck index again increased and is now 12 percent higher than that of 1964 and 22 percent higher than the 12-year average. Redheads increased 42 percent and this year's figure is 111 percent above the 12-year average. Canvasbacks showed a modest gain and are now 30 percent above the average. The reasons for the continued increase in diving duck indexes while dabbling duck numbers decline is not known. The scaup index showed a decline of 7 percent from the 1964 level, but this species was difficult to work in 1965. Because of the late season, many transient scaup were in the area during the period of survey and we attempt to exclude these from the records. It is often an arbitrary decision and this alone could account for the apparent decline.

Coot numbers showed a substantial decrease in 1965. The index was down 35 percent from 1964 and 35 percent from the 12-year average. The major decline occurred in stratum A where 1965 numbers were less than half those of 1964 (table B-53).

The 1965 lone drake figure of 74.8 percent is lower than that of 1964 and supports the view that the 1965 nesting season was later than normal. Additional evidence of a late season was the absence of early broods on the transects this May. Each year a few broods are recorded by the end of the third week or beginning of the fourth week of May, but no broods had been seen this year when surveys ended on May 28.

Production indexes

The 1965 duck brood index for strata A and B, southern Manitoba, was 14 percent below the 1964 index and 36 percent below the average of the previous 11 years. This year's coot brood index for the survey area was 23 percent above that of 1964 and 105 percent above the 11-year average.

The duck brood count in stratum A this year was very low and was 64 percent below that of 1964. The average duck brood size was 5.2 in 1965 compared to the 5.4 recorded in 1964. This year's coot brood index declined also and was 46 percent below that of 1964. The hatch was about two weeks late this year. Because of this very late hatch it was decided to rerun several transects to compare data from early versus late coverage. Five transects in stratum A were rerun on July 25. The initial coverage provided 17 broods, the rerun 36 broods--a substantial increase. Thirteen of the 36 broods were found on one transect which had yielded none on

the initial coverage. This was due in part to less than ideal weather on the first run.

The late nesting index on the first coverage of the five transects totaled 152 and on July 25 the LNI had declined to 78. The conclusion from this that although production was late, the coverage obtained in July 1965 provides a reasonable measure of the 1965 production.

The stratum B area saved the day for southern Manitoba in 1965 if estimates of production are correct. The 1965 duck brood index in B was 33 percent greater than the 1964 index. Average brood size this year was 5.7 compared to the 4.5 recorded in 1964. The coot brood index also increased, being 160 percent greater than that of 1964. Since stratum B is nearly three times the area of A the increases in duck and coot production found in B have maintained the production indexes for the entire southern Manitoba area at levels near those of 1964. In reviewing the data for stratum B it was noted that nearly one-third of the broods seen were recorded on only two segments. This "cluster" of broods may provide data representative of the whole stratum and it may not. Production in stratum B may actually be poorer than figures indicate and this will probably be the case.

The 1965 index to late nesting for strata A and B combined was only 2 percent greater than that found in 1964. This modest increase is disappointing in view of the very late hatch this year and the known near failure of the initial nesting effort. The LNI was up a small amount in A and down somewhat in B. Any late production will find abundant brood water available. The survey is summarized in tables B-54 and 55.

MICHIGAN

Data supplied by Edward J. Mikula
Michigan Department of Conservation

Weather and water conditions

This past winter was considered normal for much of Michigan, although snowfall was above normal in certain areas. Late winter temperatures were considerably below normal, and as a result the ice breakup on the Great Lakes and on interior waters was 15 to 35 days later than in 1964. The ice breakup date for southern lower Michigan was 1 to 3 days later than the 16-year average date of March 14. The migration was delayed by the late breakup dates this year. The migration peak in southern Michigan was 10 days later than the 16-year average date of March 31. There is evidence to indicate that delayed migration resulted in an appreciable increase of nesting activity by normally non-nesting species.

Precipitation during the fall, winter, and early spring increased water levels over much of the State. Water levels on the Great Lakes have risen from the near-record low level of 1964, but much of the shoreline breeding habitat is still dry and unusable. Available inland waterfowl habitat increased from 1964. From the standpoint of available breeding habitat, 1965 is one of the best years since the late 1950's. Temperatures during the nesting season were slightly above normal with ideal weather conditions. Nesting success was high this year.

Breeding population indexes

The potential waterfowl breeding population is down from 1964, but still ranks among the best (table B-56).

The percentage of mallards and blue-winged teal increased this year while all other species showed a decline.

There was a marked increase in the presence of normally non-nesting species such as shoveler, pintail, and redhead.

Brood production appears to have been excellent, with brood size above average. The number of lone drakes tallied was the second highest on record (table B-57).

Wood duck breeding population was recorded as part of the regular breeding pair and brood surveys. Many established census routes are not in good wood duck habitat, so these data are probably on the conservative side; they indicate population

trends but do not provide a basis for estimating numbers. With a more favorable water picture in 1965, it is quite possible that wood ducks were scattered, which would account for the decline this year.

The number of breeding wood ducks per lineal mile of census route was lower than in 1964, but the fourth highest in 13 years. The apparent drop in the breeding population was offset by an increased in brood production. Brood size averaged 7.94 young per adult female (table B-58).

Production Indexes

Waterfowl production was excellent this year and in part the success is attributable to improve habitat conditions. Total Statewide waterfowl production is apparently one of the highest on record and some 6 percent above the previous high of 1963.

WISCONSIN

Data supplied by Wisconsin Conservation Department

Weather and habitat conditions

The winter of 1964-1965 was characterized by normal to heavy snowfall over most of Wisconsin. Spring rains were abundant and water conditions in 1965 were excellent over all of Wisconsin producing the best breeding habitat in 3 years.

Production areas suffered from lack of rain in June, particularly in the best quality habitat in the southeastern part of the State. Survival of broods in that area was undoubtedly reduced; however, abundant July rainfall improved type IV and type V areas, and the condition for broods was generally good.

The cold, wet spring delayed the onset of nesting, however, and broods of mallards and wood ducks appeared later than in most years. The major nesting species, blue-winged teal, was not delayed as much as the early breeders.

Breeding population indexes

The index data indicated a population of 62,000 ($\pm$9,000) breeding ducks. It was assumed that one-fourth of the blue-winged teal and wood ducks present were observed, and two-thirds of the mallards and other ducks. An expansion of the data results in a total breeding population of 157,400 ducks. Blue-winged teal comprised 50 percent of this population, mallards 29 percent, and wood ducks, black ducks and seven other species comprised the remaining 21 percent.

Reports from most game managers for Wisconsin's 72 counties indicate that this year's breeding population is moderately larger than that in 1964. It was reported that blue-winged teal and several lesser and wood ducks were moderately lower than in 1964.

Utilization of nest boxes by wood ducks was higher than in 1964. Of 214 houses checked, 51, or 24 percent, were used. In 1964, 34 (17 percent) of 199 houses were used. There may be a tendency for houses to be checked in the better areas only.

Production indexes

Potential production probably was reduced because of the late spring. Indicated nest losses in hay fields were substantial. The 1965 brood sizes also tended to be fewer than in 1964, although sample sizes are small (table B-59).

Although a late nesting season and other factors may have reduced potential production, Wisconsin's contribution to the fall waterfowl flight should show a moderate improvement over 1964.

INDIANA

Data supplied by Russell R. Hyer

Weather and habitat conditions

Throughout the State, waterfowl habitat conditions appeared to be excellent. Water

levels in the primary production areas were the highest recorded since the spring of 1961. Without exception, personnel on State fish and game areas reported a marked increase in the number of waterfowl broods seen. Increases in the numbers of wood ducks, mallards, and black ducks were particularly evident. Canada goose and coot production was apparently the same as the past few years.

Production index

The stream transects were surveyed by use of an outboard motor boat with an operator and observer. A total of 70 wood duck broods were observed, a substantial increase from last year's near-record low count of 29 broods on these 4 transects and even from the 57 broods seen on all 9 streams. The current total represents an increase of 141 percent from the count in 1964; an 8 percent decline from the 5-year (1960-1964) average of 76.0; and an 11 percent rise from the figure of 63.2, which is the average of the 10 years from 1955-1964 (table B-60).

The observed total of 70 broods contained 487 young wood ducks. Of these broods, a complete count of ducklings was made on 61, containing 465 young, an average of 7.6 young per brood. Complete brood sizes ranged from 1 to 17.

MISSOURI

Data supplied by Missouri Department of Conservation

Weather and water conditions

Nesting conditions in late April and May were classified as excellent for wood ducks. Temperatures were above normal and water levels favorable. Early nesting attempts were successful in bringing off many broods. Flooding conditions that existed throughout most of June, coupled with heavy vegetative cover, made observations exceedingly difficult, particularly in relation to brood observations in lake and marsh habitat. Precipitation throughout June caused flooding even more severe than in 1964. Due to high water conditions the survey of both stream and lake marsh habitat was reduced by 24 and 36 percent, respectively.

Production indexes

Wood duck nesting efforts per square mile of marsh and lake habitat showed a significant increase of 82 percent while brood observations decreased by 20 percent. The decrease in broods was partially due to observation difficulties correlated with flooding and heavy vegetative cover. Lake and marsh habitat in southern portions of the State showed an increase of 60 percent in pair observations. This indicates that production in lake and marsh habitat was either delayed or early nesting attempts were unsuccessful. Late nesting attempts (not surveyed) could result in a considerable addition to 1965 production.

Wood duck nesting efforts per mile of stream show approximately a 7 percent increase over 1964 with number of broods sighted increasing to an all-time high of 0.17. A point of interest is the increase in brood sightings while miles of stream censused decreased by 24 percent. These findings indicate slightly higher productivity on streams in 1965 irrespective of high water levels.

A marked increase (28 percent) in average number of ducklings per brood was recorded in the class III age group while class I and II remained relatively unchanged. Brood size for all age groups combined increased by approximately 4.0 percent.

Mallards and blue-winged teal production in Missouri remains relatively insignificant. Sightings of broods from either of these species are quite rare.

The 1965 nesting survey in Missouri indicates that wood duck production is slightly above last year's (table B-61).

SOUTHWEST MANITOBA

Data supplied by Charles Lacy
Ducks Unlimited, Canada

Weather and habitat conditions

Overall, water conditions appear about as in 1963 and might be considered about "average" for Manitoba, though still 21 percent above the 5-year average (1960-1964) of 1,455 ponds. In May, a total of 1,634 ponds were recorded, a decrease of 26 percent below the 2,088 ponds noted in 1964, but still above the record low reached in 1961 of 903 ponds (table B-62).

The clearing of brush and filling of ponds with debris continues at a rate similar to that of the past several years, with 11 ponds observed to have been filled in 1964 compared to 15 in 1963 and 14 in 1962. To date, a total of 45 ponds have been filled to a degree that would appear to render them unsuited for use by nesting ducks.

Upland cover, where undisturbed by burning, is in excellent condition. Emergent cover appears to be more than adequate in quantity for the number of over water nesters present. In some cases burning or high water levels have reduced the amount and quality of both over water and upland cover available. Even so, however, there appears to be more than enough habitat available for the breeding population now in Manitoba.

The 1965 spring migration was late due to unseasonably cold weather. The first major migration of Canada geese onto the Winnipeg-Portage Plains occurred April 13, 3 days later than in 1964 and about two weeks later than in 1963. The early nesting mallards and pintails moved into the Melita area March 31. These species arrived about two weeks later than in 1963, and about in phase with last year.

The first large-scale initiation of nesting probably began about April 25. By May 1 lone mallard and pintail drakes were common. The lone drake index, providing quantitative data on the stage of the nesting cycle during the survey period, showed nesting chronology to be advanced far ahead of 1961, slightly ahead of last year, and about in phase with 1963.

Breeding population indexes

The total waterfowl breeding pair index was only 5 percent below that of 1962, but 43 percent below 1964. All major species except the canvasback showed marked decreases ranging from 30 percent to more than 50 percent. The canvasback index remains practically unchanged from last year, with a reduction of only 4 percent recorded. The mallard index was 29 percent below 1964, and the lowest since the present system of transects was begun in 1960 (table B-63).

Weather during the inventory period was frequently windy and may have depressed population figures somewhat.

Production indexes

On the basis of Ducks Unlimited project brood counts, duck production from southwest manitoba will be poorer than in 1964. The only district where reproductive success appears to be good, as good as in 1964, is the western Minnedosa Hills approximately from Shoal Lake west to Russel. However, even here the breeding population was lower than in 1964, and the total number of young produced will be less (table B-64).

Exclusive of the western Minnedosa Hills, the first nesting attempts met with poor success. There was an extensive, probably greater than usual, renesting effort which apparently was partially successful. However, it appears that terrential rains July 19 and 20 over about 25 percent of the southwest Manitoba pothole range must have flooded a substantial proportion of late nests not yet hatched. According to one report, severe hail killed many ducklings in the area west of Oak Lake.

The important Tiger Hills-Pambina Hills can be expected to be somewhat less

productive than in 1964 which was a poor year in that region. Likewise, the Melita-Virdan-Elkhorn habitat block is apparently poor this year. At Redvers, Saskatchewan, a Bureau of Sport Fisheries and Wildlife study area which held 170 breeding pairs this past spring produced only 22 broods (plus some 5 or 6 "indicated" pairs that would probably represent potential late nests).

In the eastern part of the Minnedosa Hills the efforts of most species appear to have met with poor success. Population of broods on the Rivers chronology census strip have run consistently 60 to 70 percent below those of last year. The canvasback and redhead have experienced about average nesting success, though few broods of even these species can be found.

The previously hoped-for surge of late-hatched broods did not materialize, though some broods have still to hatch. Those late broods, however, will not compensate for the reduced number of broods observed to date.

ALBERTA

Data supplied by Fred Sharp
Ducks Unlimited, Canada

Weather and habitat conditions

The observers all stressed the fact that although many of the water areas are quite temporary there was a good interspersion of brood sloughs which would last all season and drought losses should be minimal. Seepage will be heavy this year after the long drought but slough bottoms will be conditioned for minimum loss to this source for the 1966 season.

Breeding population indexes

In the area covered on the Ducks Unlimited transects, the number of breeding pairs increased 11 percent from 1964 which is 20 percent below the 10-year average, 1951 to 1960.

Substantial gains in the number of water bodies on the southern prairies this year resulted in greatly increased numbers of breeding pintails, 84 percent in the Strathmore area and 226 percent in the area based on Brooks. Province-wide, the pintail breeding population increased 105 percent. Mallards also increased on the southern prairies in response to good water conditions but these increases were more than offset by decreases on the northern transects. As a result, the number of mallard pairs counted was slightly below 1964.

The northern transects showed an overall reduction in breeding pairs of 16 percent, although the number of water areas increased by 70 percent. Most minor species were somewhat less numerous than in 1964. Corresponding increases in most species were recorded for the southern transects (table B-65).

On the Lac la Biche transect, a supplementary run not included in the general summary, the number of water bodies doubled. However, the number of breeding pairs remained unchanged from 1964 although the species composition was quite different. The Peace River-Grande Prairie area, also a supplementary run, showed a 25 percent reduction in breeding pairs but the number of water bodies was unchanged.

Production indexes

The specialized brood counts were carried out in mid-July on Ducks Unlimited projects in the Strathmore, Brooks, Hanna, and Peace River area. Results of the brood counts were quite gratifying. In all areas the counts proved higher than anticipated. Heavy emergent and upland growth made brood counts difficult.

The mallard production in the extreme south was poor. In the central areas good; in the Edmonton area only fair; in the Peace River area very good. The forecast for a duck flight this fall is equally as good as that of 1964 from Alberta.

SASKATCHEWAN

Data supplied by R. T. Sterling,
Ducks Unlimited, Canada

Weather and habitat conditions

Water conditions showed a marked improvement (79 percent) over 1964, which is 19 percent above the average of the base period 1953 to 1960. In numbers of water areas the habitat is almost as good as the best years of the midfifties, but, although there is no concern for this year's production, carry-over reserves are not so assured. However, the eastern parklands remain good and the larger brood ponds there are good for more than one season.

Breeding population index

Earlier impressions of a light spring migration have been confirmed by the breeding population counts. The sample counts indicate an over-all reduction of 29 percent, which is 73 percent below the average of the base period. Surprisingly, the largest percentage decline occurred in the prairie region where the season has not been so retarded as further north and where most districts have been favoured with a return to near ideal habitat conditions. These areas produced few birds in recent years, and it appears most of the returning birds, the bulk of which would be parkland-raised, over flew the prairies to return to their more northern breeding grounds.

Mallards declined nearly 50 percent, with declines in the prairie and eastern parkland alike. The status of this species was relatively unchanged in the western parklands but this area showed a 31 percent increase in over-all population. Pintail numbers remain about the same as last year, but the population has shifted to the preferred prairie habitat now that the water has been restored. The third most numerous species, the blue-winged teal, showed a 35 percent decrease. Figures on all other common dabbling species showed similar numbers with 1964 or light downward trends. The diving species were little changed from 1964 with canvasback showing a good increase in the eastern parklands (table B-66).

Although the duck population is considerably reduced this year, especially so with the most important mallard species, with the marked improvement in habitat there is optimism about production success and, unless the summer is exceptionally dry, with the reserve of water that will be carried over to 1966.

Production index

Late June prospects of a late but highly successful production in the mallard and pintail species fell below expectations. Extensive coverage of wetlands throughout the settled part of the Province during the latter part of July found the bulk of the hatch off but in total falling somewhat below the 1964 level. Although results did show a good late nesting effort, with most broods appearing from very late June to mid-July, the final degree of success has not compensated for the lower breeding population present at the start.

A few broods hatched during the last week of July and an unusual high number of pairs and lone females, especially in the mallard, still confused the picture, but the final outcome cannot be expected to significantly improve.

Production in the later breeding dabbling species has been good. Judging from brood age distribution, the hatch peaked during early July when the main hatch of the mallard and pintail was appearing. Because of the apparent high success of the first nesting attempts in these species, relatively few late broods are expected.

In the diving duck species, the redhead and canvasback both appear to have been highly successful in the eastern parklands. Much of the hatch of the canvasback has been owing to the very late or second nesting attempts.

The status of the scaup throughout Saskatchewan is still unclear at the present time. Brood numbers are below usual success levels, but this can change within days if it is because of a late hatch rather than a general lack of success. Owing to nest location, this species would suffer most from rising water levels which were general during the nesting period in the districts where scaup breeding numbers were highest.

WATERFOWL KILL SURVEY

Data supplied by M. Edwin Rosasco
Bureau of Sport Fisheries and Wildlife

Scope and methods

Each year, immediately after the hunting season, the Bureau of Sport Fisheries and Wildlife conducts a national mail questionnaire survey of waterfowl hunters designed to meet the following objectives:

1. Estimate, at the flyway level, the total waterfowl bag by species (adjusted for response bias) and the total crippling loss for ducks, geese, and coots.
2. Estimate, at the State and flyway level, the total number of potential adult hunters, average number of days hunted and ducks and geese bagged per potential adult hunter, and total days hunted and ducks and geese bagged by all waterfowl hunters (adult and junior), unadjusted for response bias.
3. Measure the percent change of each of these estimates from those of the previous year.

The 1964-65 hunting season is the 13th consecutive year of the survey since its start in 1952.

Since there is no complete listing of waterfowl hunters, this survey, by necessity, uses as its sampling universe those post offices throughout the nation which sell Migratory Bird Hunting Stamps ("duck stamps"). This year, 2,736 post offices were selected to cooperate in the survey as "sample outlets." These sample outlets were randomly selected, within States, from four strata (small, medium, large, and very large) of post offices, based on actual dollar sales of duck stamps. Geographic zoning within States was also used to insure a more even distribution of sample outlets throughout a State.

The post office stratification system and geographic zoning of States used in 1963 were employed again this year. The calculations themselves were based on potential adult waterfowl hunters rather than active adult waterfowl hunters. This change was made to simplify the calculations and does not affect the estimates of kill. The 1963 means per hunter have been adjusted to this new base to provide the usual comparisons. Additional adjustments were made in the Massachusetts totals due to corrected 1963 stamp sales based on reports received from the Post Office Department after the final 1963 kill estimates were prepared.

Data from those portions of Colorado, Montana, New Mexico, and Wyoming lying west of the Continental Divide were assigned to the Pacific Flyway for both 1963 and 1964. The Colorado waterfowl harvest and activity figures in this report do not include that which took place during the experimental October season in the San Luis Valley.

Estimates of the total kill and crippling losses for scoter, eider, and oldsquaw, which have a special season in Connecticut, Maine, Massachusetts, New Hampshire, New York, and Rhode Island, have been made for hunting seasons in

both 1963 and 1964. These estimates were added to the State duck harvest figures, and they revised the previous 1963 harvest and species composition estimates for these States and the Flyway. The sea duck estimates are based on questionnaire information similar to that for the regular season duck harvest but may contain different biases, among which is a tendency (probably) to underestimate the harvest of sea ducks. The species composition of the sea duck kill derived from the Wing Survey and summarized at the flyway level is also of uncertain reliability. For purposes of this report and until more information becomes available, sea duck estimates have been combined with other duck harvest figures and have received the same adjustments with one exception--the sea duck harvest by persons under 16 years of age was assumed to be negligible and was ignored.

Names and addresses of hunters are obtained by means of a business-reply "contact card" distributed to all persons buying duck stamps at sample outlets. The card requests the individual's name and address, the number of stamps he purchases, the reason for his purchase, and the number of persons in his household under the stamp requirement age of 16 years who might hunt waterfowl during the season.

All contact-card respondents who purchase stamps for the purpose of hunting are mailed a hunter questionnaire at the close of the season. The 1964-65 questionnaire asks each hunter the total number of days he hunted waterfowl, his total bags of ducks, geese, and coots, and the number of each he knocked down in sight but did not retrieve. These data, in combination with the total reported sale of duck stamps by State, have been used to derive the various survey estimates.

It has been the custom for the past 3 years to present preliminary kill estimates in an Administrative Report which is distributed prior to the Waterfowl Regulations Meeting in early August and then to publish an amended report in the annual Waterfowl Status Report later in the fall. The early Administrative Report is based on reports of duck stamp sales through the third quarter of the fiscal year while the material in the Waterfowl Status Report is based on total sales through the fourth quarter. Until about 1959, reports on duck stamp sales through the third quarter were regularly within a few percentage points of total sales. Since 1960 there have been considerable deviations in the proportion of the total sales reported through the third quarter in some States. Since these deviations in sales are not predictable, it has been necessary to revise the kill estimates prepared for use of the Regulations Committee.

In developing the kill estimates, the necessary means, variances, and totals were computed for each post office dollar-sales stratum within each geographic zone and then were weighted and expanded to give the desired calculations for zone, State, and flyway.

It should be noted that the hunting activity and harvest estimates presented for each State and flyway relate to the areas in which the duck stamps were purchased. Thus, for example, the small estimated goose kill for Arkansas (where the goose season was closed in 1963 and 1964) probably relates to birds shot in neighboring States by hunters purchasing their duck stamps in Arkansas.

As in the past 3 years, the flyway bag estimates for ducks, geese, and coots were adjusted for response bias in reported figures by using the correction factors calculated in 1960. The hunting activity and bag of junior hunters have again been estimated, using expansion factors based on findings in previous years. The species composition of the duck and goose harvest is based on the results of the annual Duck Wing and Goose Tail Collection Surveys.

Pacific Flyway

An estimated 2, 502, 900 ducks were bagged in the Pacific Flyway during the 1964-65 waterfowl season, a decrease of 11 percent from the previous season (table

C-1). An additional 530,600 ducks were knocked down but not retrieved, for a total kill (bag plus cripples) of approximately 3,033,500 ducks.

Analysis of the total Flyway duck bag by species, as derived from data provided by the Duck Wing Survey, shows that the bag of mallards (968,700) comprised 39 percent of the total bag of all species. The bags of pintail (452,200), green-winged teal (328,600), American widgeon (289,800), and shoveler (112,200), together with mallards, comprised 86 percent of the Flyway bag of all ducks. The bags of most important species of ducks decreased from the previous year, except for mallards which increased 8 percent (table C-1). The duck kill at the State level is presented in table C-3.

The total Flyway goose bag of an estimated 292,600 birds decreased 12 percent from the previous season. An additional 61,900 geese were reported knocked down but not retrieved, for a total kill (bag plus cripples) of approximately 354,400 geese (table C-2). The State goose kill data are in table C-3.

An estimated 99,000 coots were bagged in the Flyway, an increase of 36 percent over the previous season. An additional 66,100 coots were knocked down but not retrieved, yielding a total kill (bag plus cripples) of about 165,200 coots.

A total of approximately 321,300 potential adult hunters, a very slight decrease from the previous season, was registered for the Flyway. Of these potential adult hunters, 80 percent were active hunters, the same percentage as the previous season (table C-4). A total of 2,026,500 hunter-days afield (including junior hunter-days) was estimated for the Flyway, only a slight decrease from the previous season (table C-3).

Central Flyway

An estimated 1,295,400 ducks were bagged in the Central Flyway during the 1964-65 waterfowl season, an increase of 28 percent over the previous season (table C-5). An additional 315,000 ducks were knocked down but not retrieved, for a total kill (bag plus cripples) of approximately 1,610,400 ducks.

Analysis of the total Flyway duck bag by species, as derived from data provided by the Duck Wing Survey, shows that the bag of mallards (526,500) comprised 41 percent of the total bag of all species. The bags of green-winged teal (166,600), pintail (122,100), gadwall (108,200), and American widgeon (104,300), together with mallards, comprised 79 percent of the Flyway bag of all ducks. The bags of most species of ducks showed substantial increases over those of the previous year, except that the bag of blue-winged and cinnamon teal decreased 34 percent (table C-5).

All States registered substantial increases in the total duck bag over the previous season, except Colorado (-9%), New Mexico (-31%), and South Dakota (-24%) (table C-7).

The total Flyway goose bag of an estimated 257,500 birds decreased only 2 percent from the previous season. An additional 43,500 geese were knocked down but not retrieved, for a total kill (bag plus cripples) of approximately 300,900 geese (table C-6). Most States showed decreases or little change in the total goose bag as compared to the previous season, except Kansas (+107%) which showed a substantial increase (table C-7).

An estimated 23,200 coots were bagged in the Flyway, an increase of 7 percent over the previous season. An additional 17,600 coots were knocked down but not retrieved, yielding a total kill (bag plus cripples) of about 40,800 coots.

A total of approximately 280,400 potential adult hunters, an increase of 7 percent over the previous season, was registered for the Flyway. Of these potential adult hunters, 80 percent were active hunters, compared to 76 percent active the previous season (table C-8). A total of 1,635,000 hunter-days afield (including junior hunter-days) was estimated for the Flyway, an increase of 15 percent over the previous season (table C-7).

Mississippi Flyway

An estimated 3,560,300 ducks were bagged in the Mississippi Flyway during the 1963-64 waterfowl season, an increase of 42 percent over the previous season (table C-9). An additional 897,000 ducks were estimated to have been knocked down but not retrieved, for a total kill (bag plus cripples) of approximately 4,457,300 ducks.

Analysis of the total Flyway duck bag by species, as derived from data provided by the Duck Wing Survey, shows that the bags of nine species--mallard (1,317,000), wood duck (320,500), ring-necked duck (301,500), green-winged teal (288,200), lesser scaup (244,100), American widgeon (205,400), blue-winged teal (175,100), pintail (163,600), and gadwall (147,100)--totaled 3,162,500 ducks or 89 percent of the Flyway bag of all species. The bags of most species of ducks showed substantial increases, except that the bags of blue-winged teal and wood ducks decreased 11 and 14 percent, respectively (table C-9).

All States registered increases in the duck kill except Alabama (-24%), Mississippi (-22%), and Ohio (-2%). The increases were usually due both to an increase in hunters and an increase in the mean duck kill per hunter (table C-11).

The total Flyway goose bag of an estimated 249,500 birds increased 38 percent over that of the previous season. An additional 41,900 geese were reported knocked down but not retrieved, for a total kill (bag plus cripples) of approximately 291,300 geese (table C-10). The goose kill at the State level is presented in table C-11). Indiana, Ohio, and Wisconsin had substantial increases in the goose kill over the previous season.

An estimated 286,300 coots were bagged in the Flyway, an increase of 29 percent over that of the previous season. An additional 84,800 coots were knocked down but not retrieved, for a total kill (bag plus cripples) of approximately 371,000 coots.

A total of approximately 660,000 potential adult hunters, an increase of 16 percent over the previous season, was registered for the Flyway. Of these potential adult hunters, 84 percent were active hunters compared to 81 percent active the previous season (table C-12). A total of 4,045,700 hunter-days afield (including junior hunter-days) was estimated for the Flyway, an increase of 29 percent over the previous season (table C-11).

Atlantic Flyway

An estimated 995,400 ducks were bagged in the Atlantic Flyway during the 1964-65 waterfowl season, an increase of 10 percent over the previous season (table C-13). An estimated 246,700 ducks were knocked down but not retrieved, yielding a total kill (bag plus cripples) of approximately 1,242,200 ducks.

Analysis of the total Flyway duck bag by species, as derived from data provided by the Duck Wing Survey, shows that the bags of five species--black ducks (242,400), mallards (160,200), wood ducks (105,600), green-winged teal (86,200), and ring-necked ducks (69,300)--totaled 663,700 ducks or 67 percent of the Flyway bag of all species. The kill increased for approximately half of the species, including mallards, black ducks, green-winged teal, canvasbacks and redheads, whereas the kill of mottled and Florida ducks, gadwalls, blue-winged teal, pintails, wood ducks, and scaup decreased (table C-13).

At the State level, all States registered increases in the total duck bag except Florida, Georgia, Rhode Island, South Carolina, Virginia, and West Virginia, which decreased from the previous season (table C-15).

The total Flyway goose bag of an estimated 159,000 birds decreased only 1 percent from the previous season. An estimated 25,100 geese were knocked down but not retrieved, for a total kill (bag plus cripples) of approximately 184,200 geese (table C-14).

An estimated 72,200 coots were bagged in the Flyway, an increase of 53 percent

over the previous season. An estimated 20, 100 coots were knocked down but not retrieved, yielding a total kill (bag plus cripples) of about 92, 300 coots.

A total of approximately 280, 800 potential adult waterfowl hunters, an increase of 5 percent over the previous season, was registered for the Flyway. Of the potential adult hunters, 78 percent were active hunters, compared to 73 percent active the previous season (table C-16). A total of 1, 489, 100 hunter-days afield (including junior hunter-days) was estimated for the Flyway, an increase of 19 percent over the previous season (table C-15).

APPENDIX

A. WATERFOWL WINTER SURVEY TABLES

TABLE A-1.--Survey of waterfowl on their winter habitat, January 1965

[Nearest hundreds]

Species	Pacific Flyway [2]	Central Flyway [1]	Mississippi Flyway	Atlantic Flyway	Total North America
Ducks:					
Dabblers:					
Mallard	1,593,800	1,830,100	2,972,000	175,100	6,571,000
Black duck	--	100	158,900	329,800	488,800
Mottled duck	--	11,800	52,500	3,300	67,600
Gadwall	97,800	151,900	1,209,600	23,400	1,482,700
American widgeon	1,055,200	361,200	690,600	91,900	2,198,900
Green-winged teal	694,000	246,200	656,900	50,900	1,648,000
Blue-winged teal	138,200	69,900	93,300	8,300	309,700
Cinnamon teal	9,200	--	--	--	9,200
Shoveler	611,200	93,100	202,700	14,000	921,000
Pintail	2,907,700	566,500	1,006,400	132,400	4,613,000
Tree duck	--	4,800	--	--	4,800
Subtotal	7,107,100	3,335,600	7,042,900	829,100	18,314,700
Divers:					
Redhead	59,100	444,400	48,300	105,500	657,300
Canvasback	54,900	21,700	41,600	158,700	276,900
Scaup	273,800	125,500	402,500	694,300	1,496,100
Ring-necked duck	9,400	19,800	125,100	137,400	291,700
Goldeneye	53,300	8,200	24,000	74,400	159,900
Bufflehead	36,200	5,800	4,000	31,500	77,500
Ruddy duck	191,800	54,300	30,700	62,200	339,000
Subtotal	678,500	679,700	676,100	1,264,000	3,298,300
Miscellaneous:					
Eider and scoter	13,600	--	--	191,500	205,100
Oldsquaw	800	--	1,600	--	2,400
Merganser	16,900	104,800	61,300	48,100	231,100
Subtotal	31,300	104,800	62,900	239,600	438,600
Unidentified	229,900	160,000	35,600	45,600	471,100
Total ducks	8,046,800	4,280,100	7,817,500	2,378,300	22,522,700

See footnotes p. 36

TABLE A-1. --Survey of waterfowl on their winter habitat, January 1965--continued

[Nearest hundreds]

Species	Pacific Flyway 2	Central Flyway 1	Mississippi Flyway	Atlantic Flyway	Total North America
Geese:					
Snow goose	482,300	290,700	53,300	46,500	872,800
Blue goose	--	138,500	357,400	400	496,300
White-fronted goose	99,900	40,300	33,700	--	173,900
Canada goose	137,900	245,300	443,900	482,500	1,309,600
Cackling goose	103,400	--	--	--	103,400
Ross' goose	31,900	--	--	--	31,900
Total geese	855,400	714,800	888,300	529,400	2,987,900
Brant:					
American brant	--	--	--	181,600	181,600
Black brant	165,800	--	--	--	165,800
Total brant	165,800	--	--	181,600	347,400
Swans:					
Whistling swan	42,645	--	200	54,000	96,845
Trumpeter swan	355	200	--	--	555
Total swans	43,000	200	200	54,000	97,400
Coots	653,800	1,287,300	846,800	367,400	3,155,300
Grand total	9,764,800	6,282,400	9,552,800	3,510,700	29,110,700

[1] Includes east coast and central highlands of Mexico.
[2] Includes west coast of Mexico.

TABLE A-2. --Distribution of wintering waterfowl, North America, 1965

[Nearest hundreds]

State	Ducks	Geese	Brant	Swans	Coots	Total
Pacific Flyway:						
Washington	738,200	44,300	20,000	700	13,800	817,000
Oregon	396,600	39,000	1,300	4,300	80,800	522,000
Idaho	474,600	12,000	--	400	11,900	498,900
Nevada	79,900	14,700	--	8,100	7,700	110,400
California	4,574,300	731,800	3,400	25,900	414,600	5,750,000
Utah	53,300	3,800	--	3,600	1,900	62,600
Arizona	24,600	4,700	--	--	15,900	45,200
Montana	27,600	800	--	--	7,700	36,100
Wyoming	3,600	100	--	--	--	3,700
Colorado	14,000	100	--	--	--	14,100
New Mexico	1,400	--	--	--	100	1,500
Mexico (west coast)	1,658,700	4,100	141,100	--	99,400	1,903,300
Flyway total	8,046,800	855,400	165,800	43,000	653,800	9,764,800
Central Flyway:						
Colorado	195,800	44,500	--	--	--	240,300
Nebraska	201,700	5,500	--	--	--	207,200
Kansas	514,000	29,500	--	--	--	543,500
Oklahoma	237,800	18,400	--	--	7,700	263,900
New Mexico	48,700	11,600	--	--	600	60,900
Texas	2,132,000	517,100	--	--	1,002,300	3,651,400
Montana	83,500	1,500	--	200	--	85,200
Wyoming	37,800	1,300	--	--	--	39,100
North Dakota	1,200	100	--	--	--	1,300
South Dakota	153,200	9,300	--	--	--	162,500
Mexico (east coast)	371,800	28,100	--	--	211,900	611,800
Mexico (interior)	302,600	47,900	--	--	64,800	415,300
Flyway total	4,280,100	714,800	--	200	1,287,300	6,282,400
Mississippi Flyway:						
Minnesota	15,400	8,600	--	--	--	24,000
Wisconsin	29,800	3,000	--	--	--	32,800
Michigan	58,300	5,800	--	200	--	64,300
Iowa	103,400	600	--	--	--	104,000
Missouri	318,700	95,600	--	--	1,600	415,900
Illinois	274,900	190,700	--	--	--	465,600
Indiana	22,100	6,600	--	--	1,000	29,700
Ohio	114,900	4,000	--	--	--	118,900
Arkansas	1,379,500	12,300	--	--	26,000	1,417,800
Mississippi	160,900	900	--	--	9,100	170,900
Louisiana	4,769,100	435,100	--	--	744,300	5,948,500
Alabama	76,700	41,700	--	--	25,400	143,800
Kentucky	33,100	19,700	--	--	100	52,900
Tennessee	460,700	63,700	--	--	39,300	563,700
Flyway total	7,817,500	888,300	--	200	846,800	9,552,800

TABLE A-2. --Distribution of wintering waterfowl, North America, 1965--continued

State	Ducks	Geese	Brant	Swans	Coots	Total
Atlantic Flyway:						
Maine	68,500	100	--	--	--	68,600
New Hampshire	2,700	2,500	--	--	--	5,200
Vermont	3,000	--	--	--	--	3,000
Massachusetts	124,500	8,000	--	--	--	132,500
Connecticut	27,100	400	--	--	--	27,500
Rhode Island	17,400	300	--	--	--	17,700
New York	229,800	3,100	6,500	--	3,300	242,700
New Jersey	171,800	6,500	165,100	100	400	343,900
Pennsylvania	22,300	3,800	--	--	--	26,100
Delaware	94,700	49,600	1,200	--	100	145,600
Maryland	313,000	242,100	1,400	45,400	2,500	604,400
Virginia	81,600	69,700	7,400	600	--	159,300
West Virginia	2,200	--	--	--	100	2,300
North Carolina	124,300	109,000	--	7,900	49,400	290,600
South Carolina	508,500	26,800	--	--	69,000	604,300
Georgia	47,100	500	--	--	20,600	68,200
Florida	539,800	7,000	--	--	222,000	768,800
Flyway total	2,378,300	529,400	181,600	54,000	367,400	3,510,700

B. WATERFOWL BREEDING GROUND SURVEY TABLES

TABLE B-1. --Waterfowl breeding population index, Alaska, 1965

[Index numbers in thousands]

Species	Stratum		Total		Average	Percent change from--	
	1	2	1964	1965	1956-64	1964	Average
Ducks:							
Dabblers:							
Mallard -------	12.3	15.1	67.0	27.4	68.7	-59	-60
Gadwall -------	--	--	0.8	--	--	--	--
Widgeon ------	7.9	32.5	35.7	40.4	39.6	+13	+ 2
Green-winged teal	4.5	9.8	10.5	14.3	5.4	+36	+166
Shoveler ------	--	3.6	7.5	3.6	7.0	-52	-49
Pintail -------	128.4	111.2	378.8	239.6	342.5	-36	-30
Subtotal -----	153.1	172.2	500.3	325.3	462.2	-35	-30
Divers:							
Canvasback ---	1.7	19.1	11.2	20.8	10.3	+86	+102
Scaup ---------	166.0	188.7	562.3	354.7	535.4	-37	-34
Goldeneye -----	0.6	8.9	8.5	9.5	15.2	+11	-38
Bufflehead-----	0.6	28.0	32.0	28.6	26.7	-11	+ 7
Subtotal------	168.9	244.7	614.0	413.6	587.6	-33	-30
Miscellaneous:							
Scoter --------	163.8	26.7	148.1	190.5	247.3	+29	-23
Eider ---------	27.0	--	19.6	27.0	18.5	+37	+46
Oldsquaw------	48.2	1.3	92.5	49.5	85.5	-47	-42
Subtotal------	239.0	28.0	260.2	267.0	351.3	+ 3	-24
Total ducks --	561.0	444.9	1,374.5	1,005.9	1,402.1	-27	-28
Swans:							
Whistling swan-	62.3	--	50.4	62.3	64.4	+24	- 3

TABLE B-2.--Statistical summary, waterfowl breeding population survey, Alaska 1963 - 1965

	Stratum		Total
	I	II	
Area (sq. mi.) -----	43,450	33,200	76,650
Sample (sq. mi.):			
1963 ----------	200	150	350
1964 ----------	202	182	384
1965 ----------	208	204	412
Population index:			
Ducks per sq. mi.:			
1963 ----------	16.5	22.1	18.4
1964 ----------	17.4	18.7	17.9
1965 ----------	12.3	13.4	12.8
Total ducks:			
1963 ----------	679,100	734,500	1,413,600
1964 ----------	753,930	621,800	1,375,730
1965 ----------	560,898	444,985	1,005,883
Game ducks:[1]			
1963 ----------	470,650	672,800	1,143,450
1964 ----------	533,530	666,020	1,199,550
1965 ----------	321,956	416,951	738,907

[1]Excludes scoter, eider, oldsquaw, and merganser.

TABLE B-3. --Comparative brood counts from two study areas in interior Alaska, 1963 to 1965

Species	Tetlin			Yukon Flats		
	Number broods			Number broods		
	1963	1964	1965	1963	1964	1965
Mallard ----------	23	2	3	8	3	9
Widgeon ----------	23	6	7	41	14	39
Green-winged teal -	27	19	16	16	7	18
Shoveler ----------	--	--	--	10	3	8
Pintail ----------	11	4	3	30	9	16
Canvasback--------	14	2	3	8	1	13
Scaup[1]----------	11	2	--	9	--	12
Total ----------	109	35	32	122	37	115

[1] Scaup not all hatched at time of survey.

TABLE B-4.--Waterfowl breeding population index, in northern Alberta, northeastern British Columbia, Northwest Territories, and Yukon, 1965 vs. 1964

[In thousands]

Species	Index for stratum (parenthetical number - previous designation)											Total		Percent change from--
	13(1.1)	14(1.2)	15(2)	06(3)	07(4)	08(5)	09(6)	10(7)	11(8)	12(9)	05(10)	1965	1964	1964
Ducks:														
Dabblers:														
Mallard	167.2	25.6	47.3	33.0	36.9	12.1	3.1	28.8	8.0	--	0.5	362.5	628.7	- 42
Gadwall	36.8	--	0.6	--	--	--	--	--	--	--	--	37.4	10.2	+267
Widgeon	32.8	29.9	7.6	30.4	11.7	5.3	3.1	42.0	13.3	1.8	4.5	182.4	245.6	- 26
Green-winged teal	9.6	34.2	1.1	17.2	2.9	17.4	1.2	9.4	1.6	--	--	94.6	172.1	- 45
Blue-winged teal	17.6	12.8	1.5	--	--	2.7	--	--	--	--	--	34.6	79.6	- 57
Shoveler	20.0	21.4	4.9	9.2	--	14.8	--	--	0.3	--	--	70.6	180.4	- 61
Pintail	49.6	8.5	15.6	25.1	12.8	5.3	1.1	34.3	34.0	9.9	4.3	200.5	212.8	- 6
Subtotal	333.6	132.4	78.6	114.9	64.3	57.6	8.5	114.5	57.2	11.7	9.3	982.6	1,529.4	- 36
Divers:														
Redhead	8.8	--	2.3	--	--	--	--	--	--	--	--	11.1	50.1	- 78
Canvasback	8.8	--	13.8	--	--	--	0.5	--	3.3	--	1.7	28.1	57.9	- 51
Scaup	193.6	200.9	12.5	324.6	124.3	43.1	113.5	355.8	40.8	39.7	21.3	1,470.1	1,587.7	- 7
Ring-necked duck	14.4	17.1	2.6	12.5	1.5	5.3	16.1	--	0.4	--	--	69.9	54.4	+ 28
Goldeneye	37.6	4.3	8.8	1.3	8.4	--	--	2.3	1.9	--	0.8	65.4	69.7	- 6
Bufflehead	139.2	51.3	2.0	20.5	1.5	6.8	4.8	--	--	--	0.1	226.2	150.8	+ 50
Ruddy duck	8.0	--	0.6	--	--	--	--	--	--	--	--	8.6	20.6	- 58
Subtotal	410.4	273.6	42.6	358.9	135.7	55.2	134.9	358.1	46.4	39.7	23.9	1,879.4	1,991.2	- 5
Miscellaneous:														
Scoter and Eider	41.6	21.4	1.0	124.0	97.3	8.2	16.8	225.8	19.5	113.6	16.8	686.0	896.2	- 23
Oldsquaw	--	--	--	38.2	28.5	--	0.6	70.8	1.9	17.9	2.5	160.4	281.5	- 43
Merganser	14.4	--	0.3	23.8	39.9	--	0.6	9.3	1.4	1.8	0.1	91.6	84.4	+ 9
Subtotal	56.0	21.4	1.3	186.0	165.7	8.2	18.0	305.9	22.8	133.3	19.4	938.0	1,262.1	- 26
Total ducks	800.0	427.4	122.5	659.8	365.7	121.0	161.4	778.5	126.4	184.7	52.6	3,800.0	4,782.7	- 21
Geese:														
White-fronted goose	--	--	--	--	--	--	--	--	--	3.8	1.1	4.9	2.4	+104
Canada goose	4.0	--	--	1.6	9.3	--	--	1.9	--	0.6	--	17.4	20.4	- 15
Swans	--	--	--	--	--	--	--	9.5	2.5	7.7	0.8	20.5	17.8	+ 15
Coots	4.7	0.7	--	--	--	--	--	--	--	--	--	5.4	23.5	- 77

TABLE B-5. --Long-term trend in pond indexes by strata and with averages and the previous year, May and July, southern Alberta, 1965

[Index numbers in thousands]

	Stratum			Total
	A	B	C	
May:				
1952	402	566	135	1103
1953	369	539	144	1052
1954	434	607	122	1163
1955	405	656	191	1252
1956	353	598	116	1067
1957	187	442	82	711
1958	255	431	120	806
1959	131	253	120	504
1960	257	550	193	1000
1961	191	432	69	692
1962	118	345	60	523
1963	170	602	72	844
1964	138	366	137	641
1965	266	637	125	1029
Average 1952 to 1965				
percent change 1965 from--				
Average	+1	+27	+4	+16
1964	+94	+74	-9	+60
July:				
1952	308	396	114	818
1953	408	363	150	921
1954	241	400	65	706
1955	218	339	66	623
1956	185	420	64	669
1957	120	288	42	450
1958	136	282	53	471
1959	93	140	74	307
1960	84	262	57	403
1961	51	153	35	239
1962	65	257	48	360
1963	145	471	73	689
1964	78	162	72	312
1965	233	485	135	853
Average 1952 to 1965				
percent change 1965 from--				
Average	+38	+54	+80	+52
1964	+199	+199	+87	+173

TABLE B-6. --Waterfowl breeding population indexes by species and stratum, southern Alberta, May, 1964 and 1965

[Index numbers in thousands]

Species	Stratum			Total		Average	Percent change from--	
	A	B	C	1964	1965	1952-65	1964	average
Ducks:								
Dabblers:								
Mallard	82	216	835	835	335	874	-60	-62
Gadwall	14	42	4	100	60	77	-40	-22
Baldpate	16	33	5	211	54	167	-74	-68
Green-winged teal	4	10	--	24	14	37	-42	-62
Blue-winged teal	21	55	2	112	78	129	-30	-39
Shoveler	39	45	11	209	95	170	-55	-44
Pintail	148	101	94	278	343	552	+23	-39
Subtotal	324	502	153	1769	979	2006	-45	-51
Divers:								
Redhead	2	27	1	44	30	45	-32	-33
Canvasback	7	33	Trace	56	40	50	-29	-20
Scaup	25	99	9	258	133	236	-48	-44
Ring-necked duck	1	2	Trace	Trace	3	1	--	--
Goldeneye	Trace	Trace	--	--	Trace	--	--	--
Bufflehead	Trace	10	--	15	10	17	-33	-41
Ruddy duck	1	6	Trace	17	7	18	-59	-57
Subtotal	36	477	10	390	223	367	-43	-39
Miscellaneous:								
Scoter	Trace	18	2	32	20	34	-37	-41
Total ducks	360	697	165	2191	1222	2407	-44	-49
Geese:								
Canada goose	--	--	--	6	--	--	-50	-25
Coots	9	36	2	89	37	84	-47	-44
Grand total	371	733	168	2286	1272	2495	-44	-49

TABLE B-7. --Lone drake index, southern Alberta, 1955 to 1965

[Expressed as percentage of total drakes]

Year	Mallard	Pintail	Canvasback
1955----------	77.30	81.16	67.37
1956----------	84.60	85.09	63.12
1957----------	92.03	88.82	81.60
1958----------	85.80	84.34	75.47
1959----------	70.66	73.26	42.84
1960----------	84.92	82.02	72.04
1961----------	77.10	74.22	63.89
1962----------	82.39	83.98	54.32
1963----------	85.44	85.44	81.27
1964----------	74.94	88.28	51.10
1965----------	82.47	74.93	65.32

TABLE B-8.--Waterfowl brood and late nesting indexes by stratum compared with previous year and long-term average, southern Alberta, 1965

[Index numbers in thousands; T = trace]

	Stratum			Total		Average 1956-1965	Percent change from--	
	A	B	C	1964	1965		1964	Average
Broods:								
Duck brood index [1]	31	60	16	189	107	221	-43	-52
Average brood size [1]	6.1	6.4	5.5	6.2	6.1	5.9	NC	+ 3
Coot brood index	2	14	11	18	27	45	+50	-40
Late nesting index [2]								
Dabblers:								
Mallard	4	5	3	3	12	5		
Gadwall	3	4	1	1	8	2		
Widgeon	2	2	1	1	5	1		
Green-winged teal	T	T	--	--	T	T		
Blue-winged teal	2	2	3	T	7	2		
Shoveler	2	4	2	2	8	2		
Pintail	4	2	2	T	8	1		
Subtotal	17	19	12	7	48	13	+586	+269
Divers:								
Redhead	1	1	T	T	2	1		
Canvasback	T	T	T	--	T	T		
Scaup	5	7	2	3	14	7		
Ring-necked duck	--	T	--	--	T	T		
Goldeneye	--	--	--	--	--	T		
Bufflehead	--	--	--	--	--	T		
Ruddy duck	1	4	--	1	5	3		
Subtotal	7	12	2	4	21	11	+425	+91
Total	24	31	14	11	69	24	+527	+188

[1] Class II and III broods only.

[2] As indicated by adult pairs and singles.

TABLE B-9. --Waterfowl production index, Washington, 1964 and 1965

[In thousands]

Species	1964	1965	Percent change
Ducks:			
Dabblers:			
Mallard	180.7	165.5	- 8
Gadwall	8.3	13.3	+64
Widgeon	27.8	25.5	- 8
Green-winged teal	6.8	11.6	+70
Blue-winged and cinnamon teal	77.7	65.1	-16
Shoveler	10.4	8.7	-16
Pintail	13.5	19.9	+47
Wood duck	19.1	11.5	-40
Subtotal	344.3	321.1	- 7
Divers:			
Redhead	19.6	17.0	-13
Canvasback	Trace	0.1	
Scaup	14.8	21.7	+46
Ring-necked duck	6.9	7.1	+ 3
Goldeneye	10.2	6.7	-34
Bufflehead	--	0.4	
Ruddy duck	18.9	25.1	+33
Subtotal	70.4	78.1	+11
Miscellaneous:			
Mergansers	5.6	2.5	-55
Total ducks	420.3	401.7	- 4
Geese: [1]			
Canada goose	--	9.9	--
Coots: [1]	--	52.8	--

[1] Data not available for 1964.

TABLE B-10. --Duck production index by areas, Oregon, 1964 and 1965

Transect	Total broods		Total young	
	1964	1965	1964	1965
Klamath Basin -------	233	172	1,447	959
Summer Lake --------	113	53	862	364
N. Lake County ------	42	4	306	37
Umatilla County ------	17	3	83	20
Jefferson County------	4	7	22	53
Wasco County --------	12	19	75	114
Malheur County ------	76	91	498	555
G. I. Ranch ---------	5	12	54	89
Columbia County -----	46	21	331	131
Totals----------	548	382	3,678	2,322

TABLE B-11. --Duck production index by species, Oregon, 1964 and 1965

Species	Number of broods		Number of young	
	1964	1965	1964	1965
Ducks:				
Dabblers:				
Mallard ----------	184	128	1,188	788
Gadwall ----------	62	25	508	186
American widgeon----------	6	12	34	85
Blue-winged and cinnamon teal ----------	115	35	831	222
Green-winged teal----------	--	3	--	15
Shoveler----------	5	--	30	--
Wood duck----------	1	13	3	81
Pintail ----------	13	21	89	140
Subtotal ----------	386	237	2,683	1,517
Divers:				
Redhead----------	183	114	1,196	643
Canvasback----------	2	2	15	9
Scaup ----------	--	1	--	2
Ruddy duck ----------	45	13	269	69
Subtotal ----------	230	130	1,480	723
Miscellaneous:				
Merganser ----------	2	--	12	--
Unidentified----------	11	15	54	79
Totals ----------	629	382	4,229	2,319

TABLE B-12.--Goose production index, Oregon 1964 and 1965

Transect	Total broods		Total young	
	1964	1965	1964	1965
Klamath River	264	210	1,192	945
Sprague River	43	21	193	95
Spring Lake	14	4	65	18
Nuss Lake	30	42	137	188
Agency Lake	48	48	216	218
Wocus Bay	41	74	187	331
Howard Bay	25	13	112	60
Summer Lake	56	21	231	98
N. Lake County	29	25	116	114
Columbia River	2	12	9	66
Wickiup Reservoir	20	7	81	21
G. I. Ranch	9	19	35	73
Malheur Refuge	333	222	1,500	1,000
Totals	914	718	4,074	3,227

TABLE B-13. --Nesting pair index, California, 1964 and 1965

Species	Sacramento Valley		Suisun Marsh		North San Joaquin Valley		South San Joaquin Valley		Northeastern California		Klamath Basin		Total	
	1964	1965	1964	1965	1964	1965	1964	1965	1964	1965	1964	1965	1964	1 965
Ducks:														
Dabblers:														
Mallard-------	23, 320	33, 440	1, 250	1, 860	2, 250	1, 130	1, 130	1, 370	4, 920	4, 430	1, 810	1, 190	34, 680	43, 420
Gadwall ------	160	80	460	770	560	530	80	100	840	950	1, 310	3, 160	3, 410	5, 590
Blue-winged and cinnamon teal	2, 240	1, 880	260	530	620	680	240	230	1, 290	870	580	480	5, 230	4, 830
Shoveler------	40	--	30	30	120	110	--	10	200	130	200	390	590	670
Pintail -------	280	200	30	--	90	70	40	10	1, 530	1, 720	2, 530	410	4, 500	2, 410
Subtotal----	26, 040	35, 600	2, 030	3, 190	3, 640	2, 520	1, 490	1, 720	8, 780	8, 100	6, 430	5, 630	48, 410	56, 920
Divers:														
Redhead ------	400	120	30	30	60	100	50	30	780	560	1, 740	1, 590	3, 060	2, 430
Scaup --------	--	--	--	--	--	--	--	--	130	60	1, 300	550	1, 430	610
Ruddy duck ---	--	120	--	--	140	60	--	--	230	160	2, 070	1, 430	2, 440	1, 770
Subtotal----	400	240	30	30	200	160	50	30	1, 140	780	5, 110	3, 570	6, 930	4, 810
Miscellaneous --	--	320	--	--	10	10	20	--	210	200	2, 320	740	2, 560	1, 270
Total ducks-	26, 440	36, 160	2, 060	3, 220	3, 850	2, 690	1, 560	1, 750	10, 130	9, 080	13, 860	9, 940	57, 900	63, 000
Canada goose---	--	--	--	--	--	--	--	--	810	1, 300	730	730	1, 540	2, 030
Coots----------	26, 400	18, 640	240	350	3, 380	1, 390	2, 130	900	2, 190	2, 150	5, 010	1, 680	39, 350	25, 110

TABLE B-14.—Fall population index, California, 1964 and 1965

	Sacramento Valley		Suisun Marsh		North San Joaquin Valley		South San Joaquin Valley		Northeastern California		Klamath Basin		Total	
	1964	1965	1964	1965	1964	1965	1964	1965	1964	1965	1964	1965	1964	1965
Ducks:														
Dabblers:														
Mallard	97,390	139,650	4,270	7,740	7,290	3,600	3,120	3,770	31,980	28,760	12,440	7,740	156,490	191,260
Gadwall	800	400	2,260	3,860	1,760	1,670	220	280	6,630	7,460	11,180	24,900	22,850	38,570
Blue-winged and cinnamon teal	8,370	7,020	950	1,990	1,920	2,630	660	640	8,390	5,620	3,990	3,120	24,280	21,020
Shoveler	180	---	120	120	380	340	---	30	1,240	760	1,240	2,420	3,160	3,670
Pintail	1,080	770	110	---	280	230	110	30	8,800	9,870	7,150	2,360	17,530	13,260
Subtotal	107,820	147,840	7,710	13,710	11,630	8,470	4,110	4,750	57,040	52,470	36,000	40,540	224,310	267,780
Divers:														
Redhead	1,750	540	120	120	190	320	140	90	5,370	3,860	12,620	10,940	20,190	15,870
Scaup	---	---	---	---	---	---	---	--	810	370	8,060	3,410	8,870	3,780
Ruddy duck	---	540	---	---	390	150	---	--	1,330	930	11,910	8,230	13,630	9,850
Subtotal	1,750	1,080	120	120	580	470	140	90	7,510	5,160	32,590	22,580	42,690	29,500
Miscellaneous	---	1,430	---	---	30	30	40	--	1,060	990	13,340	3,700	14,470	6,150
Total ducks	109,570	150,350	7,830	13,830	12,240	8,970	4,290	4,840	65,610	58,620	81,930	66,820	281,470	303,430
Canada goose[1]	---	---	---	---	---	---	---	---	16,970	17,620	6,610	5,260	23,580	22,880
Coots	121,640	85,880	1,110	1,600	18,390	7,570	11,420	4,900	13,140	12,850	25,040	10,080	190,740	122,880

[1] Includes non-breeding component.

TABLE B-15.--Aerial nesting pair surveys on comparable sample areas, Nevada, 1964-1965

Species	Pairs		Percent change from--
	1964	1965	1964
Ducks:			
Dabblers:			
Mallard	1,225	1,410	+15.1
Gadwall	745	1,024	+37.4
Cinnamon teal	1,184	1,600	+35.1
Shoveler	163	232	-42.3
Pintail	481	736	+53.0
Subtotal	3,798	5,002	+31.7
Divers:			
Redhead	1,450	2,397	+65.3
Canvasback	78	100	+14.9
Ruddy duck	1,066	1,017	- 4.5
Subtotal	2,594	3,514	+35.4
Miscellaneous	245	136	-44.4
Total ducks	6,637	8,652	+30.3
Geese:			
Canada goose	527	637	+20.8

TABLE B-16.--Waterfowl production index, by species, Nevada, 1964 and 1965

Species	Broods		Young	
	1964	1965	1964	1965
Ducks:				
Dabblers:				
Mallard	100	106	742	742
Gadwall	112	129	813	1,023
Green-winged teal	2	7	15	41
Cinnamon teal	249	238	1,829	1,700
Shoveler	5	36	30	258
Pintail	116	106	789	746
Subtotal	584	624	4,218	4,510
Divers:				
Redhead	169	226	1,177	1,595
Canvasback	19	18	125	168
Scaup	--	2	--	8
Ruddy duck	75	54	402	305
Subtotal	263	300	1,704	2,076
Unidentified	4	25	30	159
Total ducks	851	949	5,952	6,745
Geese:				
Canada goose	--	--	712	789

TABLE B-17.--Duck numbers, aerial surveys, Utah, 1964 and 1965

	Route flown						
	Box Elder County	Weber County	Davis County	Jordan River	Salt Lake County	Utah County	Total
Area sampled (sq. mi.)---------	48.0	15.5	14.2	6.2	6.7	18.0	108.6
Ducks:							
Number counted:							
1964----------	2,595	1,050	1,056	564	33	280	5,578
1965----------	2,468	1,154	986	650	27	616	5,901
Number per square mile:							
1964----------	54.1	67.7	74.4	91.0	4.9	15.6	51.4
1965----------	51.4	74.3	69.4	104.7	4.1	34.2	54.3
Percent change from 1964-------	-5	+10	-7	+15	-18	+116	+5

TABLE B-18.--Species composition of breeding populations of waterfowl Utah, 1964 and 1965

Species	Northern area		Southern area	
	1964	1965	1964	1965
Ducks:				
Dabblers:				
Mallard----------	16.0	14.4	18.3	16.2
Gadwall----------	11.6	13.4	13.7	12.1
Widgeon----------	0.1	1.1	2.1	1.9
Green-winged teal----------	0.6	0.9	11.5	7.4
Blue-winged teal and cinnamon teal ---------	17.1	18.9	12.5	17.5
Shoveler----------	10.9	7.7	6.5	8.1
Pintail----------	8.0	11.8	15.6	16.2
Divers:				
Redhead----------	29.4	24.7	14.1	11.0
Scaup----------	0.2	0.7	1.2	2.1
Ruddy duck----------	6.1	6.4	4.4	7.5

TABLE B-19. --Canada geese production index, Utah, 1964 and 1965

Area	Number of breeding pair		Number of young	
	1964	1965	1964	1965
Cutler Reservoir	5	18	20	90
Public shooting grounds	15	11	58	47
Bear River Refuge	308	348	1,369	1,566
Ogden Bay Refuge	25	64	129	288
Farmington Bay Refuge	54	61	252	281
Scipio Reservior	1	4	4	14
Redmond Lake	11	12	52	60
Gunnison Reservoir	8	6	39	30
Clear Lake Refuge	3	5	16	24
Mona Reservoir	10	2	36	9
Wales Reservoir	12	7	75	39
Rich County (Bear River)	110	90	463	440
Totals	562	628	2,513	2,879

TABLE B-20. --Aerial counts, Canada goose breeding pairs and grouped birds, Idaho, 1964 and 1965

Area	1964	1965
Snake River drainage:		
Farewell Bend to Walter's Ferry	1,748	1,331
Payette River (mouth to Emmett)	318	450
Strike Dam to American Falls Dam	231	154
North Fork, including Island Park	419	408
South Fork	158	225
Mud Lake - Camas NWR	186	216
Gray's Lake	872	799
Blackfoot Reservoir	562	418
Subtotal	4,494	4,001
Bear River drainage:		
Dingle Marsh	1,605	1,950
Total	6,099	5,951

TABLE B-21. --Canada goose production index, Idaho, 1964 and 1965

Nesting unit	Number of goslings		Percent change from 1964
	1964	1965	
Southwestern Idaho:			
Homedale	1,162	1,067	-8
Payette River	577	354	-39
Southeastern Idaho:			
Blackfoot Reservoir	317	323	+2
Island Park Reservoir	69	124	+80
North Fork Snake River	51	138	+171
North Lake	81	55	-32
Total	2,257	2,061	-9

TABLE B-22. --Number of duck broods, by species, observed on trend routes in southern Idaho, 1964 and 1965

Species	1964	1965
Milner Canal:		
Dabblers:		
Mallard	20	23
Gadwall	2	1
American widgeon	6	5
Green-winged teal	3	3
Blue-winged and cinnamon teal	2	1
Subtotal	33	33
Divers:		
Redhead	--	2
Total	33	35
Blackfoot Reservoir:		
Dabblers:		
Mallard	15	22
Gadwall	56	92
American widgeon	29	26
Green-winged teal	1	1
Blue-winged and cinnamon teal	1	2
Pintail	12	13
Shoveler	--	1
Subtotal	114	157
Divers:		
Redhead	2	2
Lesser scaup	1	2
Subtotal	3	4
Unidentified	--	3
Total	117	164

TABLE B-23. --May and July pond indexes by strata and comparisons with average and previous year, southern Saskatchewan, 1956 to 1965

Year	Stratum					Total
	A-East	A-West	B-East	B-West	C	
May:						
1956	754.4	700.3	644.8	284.2	105.8	2,489.5
1957	292.3	357.9	576.2	148.5	72.2	1,447.1
1958	526.5	350.5	498.6	191.0	105.1	1,671.7
1959	157.7	334.5	160.2	57.4	73.6	783.4
1960	479.2	987.4	377.3	164.3	90.1	2,098.3
1961	48.7	171.1	221.4	92.0	55.7	588.9
1962	153.2	336.3	635.4	173.3	49.1	1,347.3
1963	239.4	256.0	293.9	131.6	39.5	960.4
1964	508.1	202.1	325.9	114.9	37.7	1,188.7
1965	393.6	453.0	484.9	224.4	81.4	1,637.3
Average 1956 to 1965	476.2	569.7	659.9	290.1	104.6	2,069.7
Percent change, 1965 from 1964	-22.5	+124.1	+48.8	+95.3	+115.9	+37.7
Average	-17.3	-20.5	-26.5	-22.6	-22.2	-20.9
July:						
1958	212.8	141.8	267.4	107.1	33.8	762.9
1959	143.0	120.5	145.0	36.8	26.0	471.3
1960	212.4	265.2	318.1	88.0	32.7	916.4
1961	34.4	50.6	61.2	37.1	9.8	193.1
1962	75.7	61.8	68.6	26.3	13.3	245.7
1963	173.8	227.4	161.8	84.5	41.6	689.1
1964	177.8	97.3	121.6	30.5	12.3	439.5
1965	153.3	280.1	288.5	102.8	92.6	921.3
Average 1958 to 1965	441.2	310.4	346.3	148.5	58.5	1,304.8
Percent change, 1965 from 1964	-11.5	+187.9	+137.2	+237.0	+652.8	+109.6
Average	-64.3	-9.8	-16.7	-30.8	+ 58.3	-29.4

TABLE B-24.--Comparative status of waterfowl breeding population indexes by species and stratum, southern Saskatchewan, 1965

[index numbers in thousands]

Species	Stratum I					Total		Average 1956 to 1964	Percent change from:	
	A-East	A-West	B-East	B-West	C	1964	1965		1964	Average
Ducks:										
Dabblers:										
Mallard	103.8	163.1	166.6	78.1	25.8	671.4	537.4	1,546.3	- 20.0	- 65.2
Black duck	--	--	--	--	--	--	--	0.1	--	--
Gadwall	6.3	84.4	18.5	18.0	4.1	161.6	131.3	86.4	- 18.7	+ 52.0
American widgeon	11.8	30.7	16.2	17.0	4.5	88.8	80.2	152.5	- 9.7	- 47.4
Green-winged teal	1.2	5.4	2.1	3.7	0.6	7.8	13.0	22.2	+ 66.7	- 41.4
Blue-winged teal	22.0	38.4	22.6	16.8	5.4	125.5	105.2	164.1	- 16.2	- 35.9
Shoveler	16.2	50.8	19.5	19.6	6.3	177.4	112.4	192.7	- 36.6	- 41.7
Pintail	26.8	144.8	42.8	49.1	33.5	254.5	297.1	629.5	+ 16.7	- 52.8
Wood duck	--	--	--	--	--	--	--	--	--	--
Subtotal	188.1	517.6	288.4	202.3	80.2	1,487.0	1,276.6	2,793.8	- 14.1	- 54.3
Divers:										
Redhead	4.3	12.2	16.6	2.2	--	31.6	35.3	59.8	+ 11.7	- 41.0
Canvasback	8.6	18.1	23.4	9.5	1.2	57.5	60.8	110.1	+ 5.7	- 44.8
Scaup	15.0	18.2	29.2	31.2	3.6	64.8	97.2	203.1	+ 47.7	- 52.1
Ring-necked duck	0.1	5.4	1.2	3.4	0.4	10.4	10.5	8.1	+ 0.9	+ 22.8
Goldeneye	--	--	2.7	0.3	--	1.2	3.0	5.5	+ 150.0	- 45.4
Bufflehead	1.1	--	14.0	4.7	--	9.1	19.8	10.2	+ 117.6	+ 94.1
Ruddy duck	0.6	2.5	5.5	3.7	--	10.0	12.3	34.2	+ 23.0	- 64.0
Subtotal	29.7	56.4	92.6	55.0	5.2	184.6	238.9	431.0	+ 29.4	- 44.6
Miscellaneous:										
Merganser	0.6	0.1	0.6	0.5	--	1.4	1.8	2.5	+ 28.6	- 28.0
Scoter	--	--	1.8	7.7	--	8.2	9.5	6.2	+ 15.8	+ 53.2
Subtotal	0.6	0.1	2.4	8.2	--	9.6	11.3	8.7	+ 17.7	+ 29.9
Total ducks	218.4	574.1	383.4	265.5	85.4	1,681.2	1,526.8	3,233.5	- 9.2	- 52.8
Geese:										
Canada goose	--	0.1	2.7	--	0.2	3.2	3.0	1.8	- 6.2	+ 66.7
Coots	8.3	14.0	15.8	13.0	0.9	43.2	52.0	164.5	+ 20.1	- 68.4
Grand Total	226.7	588.2	401.9	278.5	86.5	1,727.6	1,581.8	3,399.8	- 8.4	- 53.5

TABLE B-25.--Lone drake index, southern Saskatchewan, 1956-65

[Expressed as percentage of total drakes]

Year	Percent of lone drakes[1]
1956----------	78.5
1957----------	80.7
1958----------	80.2
1959----------	73.0
1960----------	84.7
1961----------	71.9
1962----------	47.3
1963----------	82.6
1964----------	83.5
1965----------	81.9

[1]Includes only mallard, pintail and canvasback.

TABLE B-26. --Waterfowl brood and late-nesting indexes by stratum compared to previous year and long-term average, southern Saskatchewan, 1964 and 1965

[Index numbers in thousands]

Species	Stratum					Total		Average 1958 to 1964	Percent change from--	
	A-East	A-West	B-East	B-West	C	1964	1965		1964	Average
Broods:										
Duck brood index	3.8	12.3	17.9	12.8	3.0	66.9	49.8	219.0[3]	- 25.6	- 77.2
Average brood size[1]	5.5	6.7	6.1	5.0	5.8	5.7	6.0	5.2[3]	+ 5.3	+ 15.4
Coot brood index	0.6	0.8	5.1	1.6	0.2	9.2	8.3	35.5[3]	- 9.8	- 76.6
Late-nesting index[2]:										
Dabblers:										
Mallard	3.3	20.1	11.3	8.2	5.2	19.7	48.1	40.0	+ 144.2	+ 20.3
Gadwall	0.4	10.5	3.9	1.4	3.0	3.8	19.2	6.1	+ 100 +	+ 100 +
American widgeon	0.6	3.1	1.9	0.8	1.6	0.3	8.0	5.3	+ 100 +	+ 50.9
Green-winged teal	--	1.3	--	--	0.7	--	2.0	0.6	+	+ 100 +
Blue-winged teal	0.6	8.8	2.3	1.8	2.7	5.3	16.2	11.6	+ 100 +	+ 39.7
Shoveler		5.3	0.8	0.4	1.6	1.5	8.1	2.9	+ 100 +	+ 100 +
Pintail	0.2	5.0	0.8	0.4	0.7	1.2	7.1	5.1	+ 100 +	+ 39.2
Subtotal	5.1	54.1	21.0	13.0	15.5	31.8	108.7	71.6	+ 241.8	+ 51.8
Divers:										
Redhead	--	1.8	0.8	--	0.5	1.3	3.1	1.4	+ 138.5	+ 100 +
Canvasback	--	0.5	--	--	0.5	0.8	1.0	1.2	+ 25.0	- 16.7
Scaup	0.6	1.0	0.8	0.6	0.2	8.9	3.2	7.0	- 65.0	- 54.3
Ring-necked duck	--	0.4	--	--	--	0.1	0.4	0.9	+ 100 +	- 55.6
Goldeneye	--	--	--	--	--	0.2	--	0.3	-	--
Bufflehead	--	--	0.4	0.4	0.2	0.8	1.0	0.3	+ 25.0	+ 100 +
Ruddy duck	0.6	0.5	1.9	0.8	0.2	4.2	4.0	5.6	- 4.8	- 28.6
Subtotal	1.2	4.2	3.9	1.8	1.6	16.3	12.7	16.8	- 22.1	- 24.4
Miscellaneous ducks	--	--	--	--	--	--	--	0.6	- --	--
Total	6.3	58.3	24.9	14.8	17.1	48.1	121.4	89.0	+ 152.4	+ 36.4

[1]Class II and III broods only.
[2]As indicated by adult pairs and singles.
[3]13-year average 1952 to 1964.

TABLE B-27.--Summary, waterfowl breeding population survey, Montana, 1965

	Stratum		Total
	1	2	
Area (sq. mi.)	40,500	33,000	73,500
Sample (sq. mi.)	326.5	412	738.5
Population index:			
Ducks (per sq. mi.)	6.3	14.3	
Total ducks	256,000	471.000	727,000

TABLE B-28.--Waterfowl breeding population index, Montana, 1965

[Index numbers in thousands]

Species	Stratum		Total
	1	2	
Ducks:			
Dabblers:			
Mallard	172.5	147.5	320.0
Gadwall	10.0	59.5	69.5
Widgeon	6.0	24.5	30.5
Green-winged teal	3.0	4.0	7.0
Blue-winged teal	14.5	24.5	39.0
Shoveler	7.5	28.0	35.5
Pintail	38.0	165.5	203.5
Subtotal	251.5	453.5	705.0
Divers:			
Redhead	1.5	2.0	3.5
Canvasback	--	2.0	2.0
Scaup	2.5	11.5	14.0
Ring-necked duck	0.5	1.0	1.5
Bufflehead	trace	0.5	0.5
Ruddy duck	--	trace	trace
Subtotal	4.5	17.0	21.5
Miscellaneous:			
Merganser	trace	0.5	0.5
Grand total	256	471	727

TABLE B-29.--Waterfowl use by water type, stratum 1, Montana, 1965

Water type (Recorded on 162 sq. mi. of habitat)	Times water type observed--		Waterfowl observed		Preference rating
	Number	Percent	Number	Percent	Percent waterfowl ÷ Percent water type
Stock dam:					
Permanent	136	30.6	340	52.3	1.71
Semi-permanent	29	6.5	70	10.8	1.66
Temporary	18	4.2	6	0.9	0.21
Pothole and lake:					
Permanent	20	4.5	92	14.1	3.13
Semi-permanent	15	3.4	6	0.9	0.26
Temporary	32	7.2	24	3.6	0.50
Stream:					
Permanent	91	20.5	63	9.7	0.47
Semi-permanent	53	11.9	28	4.3	0.36
Temporary	45	10.2	20	3.1	0.30
Dugout:					
Permanent	1	0.2	2	0.3	1.50
Semi-permanent	2	0.4	--	--	0.00
Temporary	2	0.4	--	--	0.00
Total	444	100.0	651	100.0	

TABLE B-30.--Waterfowl use by water type, stratum 2, Montana, 1965

Water type (Recorded on 209 sq. mi. of habitat)	Times water type observed		Waterfowl observed		Preference rating
	Number	Percent	Number	Percent	Percent waterfowl ÷ Percent water type
Stock dam:					
Permanent ------	103	13.6	326	14.0	1.03
Semi-permanent -	15	2.0	78	3.3	1.65
Temporary -----	26	3.4	22	0.9	0.26
Pothole and lake:					
Permanent ------	78	10.3	834	35.7	3.46
Semi-permanent -	37	4.9	151	6.5	1.33
Temporary -----	248	32.8	650	27.9	0.85
Stream:					
Permanent ------	96	12.7	177	7.6	0.60
Semi-permanent -	50	6.6	46	1.9	0.29
Temporary -----	95	12.5	38	1.6	0.13
Dugout:					
Permanent ------	2	0.2	6	0.3	1.50
Semi-permanent -	3	0.4	2	0.1	0.25
Temporary -----	5	0.6	4	0.2	0.33
Total ---------	758	100.0	2,334	100.0	

TABLE B-31.--May water index, Montana, 1965

	Stratum 1		Stratum 2	
	Frequency (per sq. mi.)	Total number	Frequency (per sq. mi.)	Total number
Stock dam ---	1.13	45,765	0.69	13,770
Pothole -----	0.41	16,605	1.74	57,420
Stream [1] ----	1.16	46,908	1.15	37,950
Dugout ------	0.03	1,215	0.05	1,650
Total ------	2.73	110,565	3.63	110,790

[1] Of the streams encountered, 0.60 per square mile in stratum 1 and 0.70 in stratum 2 were of the semi-permanent and temporary variety suitable for the construction of stock dams.

TABLE B-32. --Waterfowl breeding population, by area and year, Chippewa National Forest, Minnesota, 1964 and 1965

Area	1964	1965	Percent change
Bowstring	245	301	+ 23
Burns'	109	87	- 20
Kitchie	204	162	- 20
Lower Pigeon	90	54	- 40
Mud Lake	141	150	+ 7
Raven Lake	11	8	--
Round Lake	729	445	- 39
Third River	178	365	+105
Lake Winniebigoshich	309	300	- 3
Rabideau Lake	247	178	--
Total	2,263	2,050	- 28

TABLE B-33. --Species composition, Chippewa National Forest, Minnesota, 1964 and 1965

Species	1964	1965
Mallard	43	50
Widgeon	12	16
Blue-winged teal	18	5
Wood duck	13	11
Ring-necked duck	3	4
Goldeneye	16	9
Other	1	5

TABLE B-34. --Duck production ratios, Chippewa National Forest, Minnesota, 1964 and 1965

Species	1964			1965		
	Adult	Juvenile	Ratio	Adult	Juvenile	Ratio
Mallard	524	643	1:1.2	495	539	1:1.1
Widgeon	123	158	1:1.3	107	216	1:2.0
Blue-winged teal	58	147	1:2.5	51	48	1:0.9
Wood duck	108	185	1:1.7	82	148	1:1.8
Ring-necked duck	26	47	1:1.8	26	53	1:2.4
Goldeneye	95	281	1:2.9	62	115	1:1.9
Total	934	1,461	1:1.6	823	1,119	1:1.4

TABLE B-35. -- Long-term trend in pond indexes by strata and comparisons to average and previous year, May and July, tri-State area, 1965

[Index numbers in thousands]

Year	Stratum			Total
	East	Central	West	
May:				
1959	162	109	41	313
1960	223	397	52	672
1961	151	105	33	289
1962	313	348	72	732
1963	375	413	80	868
1964	193	207	60	460
1965	255	338	84	677
Average, 1959 to 1965	239	274	60	573
Percent change, 1965 from[1] --				
Average	+ 6.7	+ 23.4	+ 40.0	+ 18.2
1964	+ 32.1	+ 63.3	+ 40.0	+ 47.2
July:				
1959	213	110	73	396
1960	309	311	116	736
1961	166	108	77	351
1962	281	231	68	579
1963	245	275	99	619
1964	154	211	70	435
1965	205	245	69	519
Average, 1962 to 1965	221	241	77	538
Percent change, 1965 from--				
Average	- 7.2	+ 1.7	- 10.4	- 3.5
1964	+ 33.1	+ 16.1	- 1.4	+ 19.3

[1]Percent change from previous year.

NOTE: Due to a change in recording water areas in 1962, July 1962 pond index is not comparable to previous counts.

TABLE B-36.--Waterfowl breeding population indexes by species and stratum, tri-State area, (North Dakota, South Dakota, and Minnesota) 1965

[Index numbers in thousands]

Species	Stratum			Total		Average 1959-1965	Percent change from--	
	East	Central	West	1964	1965		1964	Average
Ducks:								
Dabblers:								
Mallard	115	171	56	293	342	294	+ 16.7	+ 16.3
Gadwall	29	89	11	59	130	71	+120.3	+ 83.0
American widgeon	1	--	--	3	1	9	- 66.6	- 88.8
Green-winged teal	--	--	--	--	--	--	--	--
Blue-winged teal	101	171	17	309	290	224	- 6.1	+ 29.5
Shoveler	30	65	3	66	98	97	+ 4.5	+ 1.0
Pintail	36	35	12	86	83	138	- 5.8	- 39.9
Subtotal	314	532	98	816	944	829	+ 15.7	+ 13.9
Divers:								
Redhead	21	30	--	45	52	28	+ 15.6	+ 85.7
Canvasback	18	11	--	21	29	14	+ 38.0	+107.1
Scaup	9	20	5	5	34	32	+580.0	+ 6.3
Ring-necked duck	--	--	--	--	--	2	--	--
Ruddy duck	3	3	--	2	6	8	+200.0	- 25.0
Subtotal	52	65	5	73	121	84	+ 65.8	+ 44.0
Total ducks	365	597	103	889	1,065	913	+ 19.8	+ 16.6
Coots	67	72	--	67	139	99	+107.5	+ 40.4
Grand total	432	669	103	956	1,204	1,012	+ 20.6	+ 19.0

TABLE B-37.--Waterfowl brood and late-nesting indexes by stratum compared to previous year and long-term averages, tri-State area, July 1965

[Index numbers in thousands]

Species	Stratum			Total		Average 1959-1965	Percent change from--	
	East	Central	West	1964	1965		1964	Average
Broods:								
Duck brood index-----	14.6	14.9	2.9	31.7	32.4	58.5	+ 2.2	- 44.6
Average brood size[1]--	4.7	5.6	4.0	6.0	4.9	5.0	- 18.3	- 02.0
Coot brood index-----	.6	3.3	--	2.9	3.9	3.5	+ 34.5	+ 11.4
Late-nesting index: [2]								
Dabblers:								
Mallard----------	10.9	19.1	4.1	23.4	34.1	30.3	+ 45.7	+ 12.5
Gadwall----------	6.1	17.2	3.3	9.2	26.6	10.0	+189.1	+166.0
Widgeon----------	1.2	--	--	--	1.2	6.0	--	- 80.0
Green-winged teal --	--	--	--	--	--	.1	--	--
Blue-winged teal----	10.9	12.9	2.4	30.1	26.2	21.9	- 13.0	+ 19.6
Shoveler ----------	--	--	--	1.8	--	.6	--	--
Pintail----------	--	--	--	--	--	3.9	--	--
Subtotal ----------	29.1	49.2	9.8	64.5	88.1	67.2	+ 36.6	+ 31.1
Divers:								
Redhead ----------	2.4	1.8	--	2.5	4.2	3.1	+ 68.0	+ 35.5
Canvasback----------	--	--	--	.4	--	.2	--	--
Scaup ----------	--	--	--	--	--	.4	--	--
Ring-necked duck ----	--	--	--	--	--	.7	--	--
Ruddy duck ----------	3.1	5.1	--	2.6	8.2	7.5	+215.4	+ 9.3
Subtotal----------	5.5	6.9	--	5.5	12.4	11.9	+125.5	+ 4.2
Grand total -------	34.6	56.1	9.8	70.0	100.5	79.1	+ 43.6	+ 27.1

[1] Class II and III broods only.
[2] As indicated by adult pairs and singles.

TABLE B-38.--Waterfowl production index and water areas, North Dakota, 1965

Transects	Square miles	Total duck broods	Water areas
Test Run	7.5	4	52
Antelope Lakes	8.3	4	23
Drake-Anamoose	8.8	3	56
Hurdsfield-Chaseley	8.0	3	82
Cleveland-Woodworth	7.0	6	65
Medine-Gackle	7.0	14	96
Douglas	8.2	5	74
Snake Creek	7.0	5	63
Leeds Circuit	7.5	4	39
Leeds-Maza	7.8	1	35
Rugby North	7.5	5	13
Rugby South	7.5	--	10
Totals	92.1	54	608
Brood index		0.59	
Water index			6.60

TABLE B-39.--Duck broods, species composition, mid-July, North Dakota, 1955 to 1965

Species	Average 1955-1964	Percent of total 1964	1965
Mallard	16.7	10.0	11.1
Gadwall	14.8	20.0	9.3
Widgeon	1.6	2.5	5.6
Green-winged teal	0.1	0.0	0.0
Blue-winged teal	34.6	25.0	33.3
Shoveler	6.4	2.5	0.0
Pintail	15.3	17.5	14.8
Redhead	2.4	2.5	1.8
Canvasback	6.4	15.0	22.2
Scaup	0.2	0.0	0.0
Ruddy duck	1.5	5.0	1.8

TABLE B-40.--Duck broods by age class, mid-July, North Dakota, 1955 to 1965

Age class[1]	Average	Percent of total	
	1955-1964	1964	1965
Class I:			
Ia	24.1	20.0	11.1
Ib	20.5	12.5	24.1
Ic	16.8	25.0	11.1
Total	61.4	57.5	46.3
Class II:			
IIa	13.3	7.5	18.5
IIb	9.4	7.5	13.0
IIc	10.6	20.0	7.4
Total	33.3	35.0	38.9
Class III:	5.3	7.5	14.8

[1] Based on "A guide for Aging Duck Broods in the Field," by Gallop and Marshall, May, 1954.

TABLE B-41.--Statewide aerial breeding population index, Nebraska, 1964 and 1965

Species	1965	1964	Percent change
Ducks			
Dabblers:			
Mallard	36,000	69,600	-47
Gadwall	2,300	3,400	-32
Widgeon	--	700	--
Green-winged teal	200	--	--
Blue-winged teal	10,600	22,200	-52
Shoveler	2,700	5,600	-52
Pintail	6,100	22,100	-72
Subtotal	58,700	123,600	-53
Divers:			
Redhead	100	4,600	-98
Canvasback	1,300	2,500	-48
Scaup	1,000	5,800	-83
Ruddy duck	--	900	--
Subtotal	2,400	13,800	-82
Total	61,100	137,400	-56

TABLE B-42. --Aerial brood survey, Nebraska Sandhills, 1965

Age class	Broods	Ducklings	Average brood
Class I ---------	5	20	
Class II --------	9	50	
Class III --------	10	53	
Total --------	24	123	5.1

TABLE B-43. --Waterfowl breeding pairs, Wyoming, 1964 and 1965

Species	Number of pairs		Percent change from--		Total duck index		Percent change from--	
	1964	1965	1964	Average[1]	1964	1965	1964	Average[1]
Ducks:								
Dabblers:								
Mallard------	57,995	57,247	- 1.3	42.9	142,198	168,041	18.2	65.6
Gadwall------	11,441	9,139	-20.1	92.4	27,685	23,597	-14.8	109.5
Widgeon -----	5,680	9,139	60.9	174.1	13,486	29,135	116.0	274.3
Teal---------	11,243	12,547	11.6	72.7	35,258	39,638	12.4	116.4
Shoveler -----	8,080	2,373	-70.6	-40.3	28,708	10,708	-62.7	2.3
Pintail ------	19,223	8,384	-56.4	-21.7	48,555	23,091	-52.4	-16.0
Divers:								
Redhead -----	--	92	--	-77.2	--	2,470	--	80.7
Canvasback --	648	247	-61.9	-37.9	1,550	510	-67.1	-34.9
Scaup -------	--	1,075	--	211.6	--	3,272	--	248.5
Goldeneye ----	648	92	-85.8	-79.0	1,550	163	-89.5	-67.4
Bufflehead ---	--	92	--	--	--	163	--	--
Ruddy duck---	--	--	--	--	--	490	--	70.6
Miscellaneous:								
Merganser ---	605	3,509	480.0	151.4	1,210	9,281	677.0	138.3
Total ducks --	115,563	103,936	-10	57	300,200	310,559	+3	67
Coots ----------	--	--	--	--	1,504	6,083	304.3	44.7

[1] Average is the years 1955-1964.

TABLE B-44.--Canada goose breeding pairs, by area, Wyoming, 1964 and 1965

Area	1964	1965	Percent change from--	
			1964	Average
Green River ----------	432	428	--	51
North Platte River-----	348	360	3	43
Bear River ----------	747	898	20	118
Snake River----------	379	493	30	36
Wind River ----------	199	228	15	36
Big Horn River--------	40[1]	44	10	33
Total ----------	2,145	2,451	14	78

[1] Represents an estimate.

TABLE B-45.--Summary of duck breeding ground population estimates, Moffat County, Colorado, 1964 with 1965

Area	Breeding pairs			Percent change from--	
	1965	1964	11-year average 1954-1964	1964	11-year average
San Luis Valley ---------	26,682	28,755	28,755[1]	- 7.2	([1])
North Park ----------	9,044	11,000	4,570	- 17.8	+ 97.9
South Platte Valley ------	11,155	10,517	4,163	+ 6.7	+167.9
Cache la Poudre Valley --	5,057	2,381	1,781	+112.4	+183.9
Yampa Valley ----------	3,838	2,613	2,987	+ 46.9	+ 28.5
Brown's Park ----------	157	115	110	+ 36.5	+ 42.7
Totals ----------	55,933	55,381	42,366	+ 1.0	+ 32.0

[1] San Luis Valley estimates are based on results of 1964 and 1965 coverage only. The much less intensive coverage of previous years is not included in the calculations.

TABLE B-46. --Species composition of breeding duck population, Moffat County, Colorado, 1964 and 1965

Species	Number			Percent		
	1965	1964 [1]	1954-1964 average[1]	1965	1964[1]	1954-1964 average[1]
Ducks:						
Dabblers:						
Mallard	30,083	31,976	27,233	53.78	57.74	64.28
Gadwall	5,501	3,450	3,394	9.83	6.23	8.01
American widgeon	1,200	880	500	2.15	1.59	1.18
Green-winged teal	3,890	1,656	919	6.95	2.99	2.17
Blue-winged and cinnamon teal	7,314	5,377	3,627	13.08	9.71	8.56
Shoveler	2,694	2,359	1,313	5.30	4.26	3.10
Pintail	2,358	5,931	2,923	4.22	10.71	6.90
Divers:						
Redhead	1,732	2,891	1,445	3.10	5.22	3.41
Canavasback	--	2	30	--	T	0.07
Scaup	276	399	555	0.49	0.72	1.31
Ring-necked duck	27	44	76	0.05	0.08	0.18
Bufflehead	14	11	4	0.02	0.02	0.01
Ruddy duck	27	78	102	0.05	0.14	0.24
Miscellaneous:						
Merganser	547	327	245	0.98	0.59	0.58
Totals	55,933	55,381	42,366	100.00	100.00	100.00

[1] Revised San Luis Valley estimates are included in these figures.

TABLE B.47--Number of Canada geese by breeding classification, Moffat County, Colorado, 1965

Area	Nesting pairs	2-year old pairs[1]	Goslings (Estimated)[2]	Groups	Total
Yampa:					
Craig to Juniper Springs	11	25	69	47	188
Juniper to Cross Mountain	12	14	64	28	144
Lily Park	10	10	49	96	185
Subtotals	33	49	182	171	517
Green (Brown's Park)	4	6	19	8	47
Little Snake (lower,) bridge to State line	12	10	59	65	168
Totals	49	65	260	244	732

[1] Novice pairs which are potential nesters next year.

[2] This category includes both eggs and goslings counted.

TABLE B-48.--Waterfowl breeding population index, northern Saskatchewan, northern Manitoba, and western Ontario, 1964 and 1965

[Index numbers in thousands]

Species	Ontario	Stratum				Total		Percent change
		Manitoba		Saskatchewan		1964	1965	
		D	C	South	North[1]			
Ducks:								
Dabblers:								
Mallard	15.8	26.2	45.9	63.9		192.0	151.8	-21
Black duck	12.0	--	0.6	0.6		30.0	13.2	-56
Gadwall	--	4.8	--	6.0		9.0	10.8	+20
Widgeon	3.7	7.8	9.2	11.1		33.0	31.8	- 4
Green-winged teal	--	1.6	3.4	5.2		19.0	10.2	-43
Blue-winged teal	--	7.1	0.6	6.6		37.0	14.3	-61
Shoveler	--	9.3	0.6	7.5		26.0	17.4	-41
Pintail	--	5.9	0.8	2.7		21.0	9.4	-55
Subtotal	31.5	62.7	61.1	103.6		367.0	258.9	-29
Divers:								
Redhead	--	10.4	--	7.2		17.0	17.6	+ 4
Canvasback	--	16.3	1.4	6.0		37.0	23.7	-36
Scaup	29.2	40.1	32.3	75.4		197.0	177.0	-10
Ring-necked duck	18.0	7.4	16.2	15.1		45.0	56.7	+26
Goldeneye	1.5	1.4	4.5	3.6		23.0	11.0	-52
Bufflehead	1.5	0.3	1.4	2.1		9.0	5.3	-41
Ruddy duck	--	2.0	--	1.5		1.0	3.5	+250
Subtotal	50.2	77.9	55.8	110.0		329.0	294.8	-10
Miscellaneous:								
Scoter	--	0.8	6.0	0.6		8.0	7.4	- 8
Merganser	53.9	4.6	26.6	32.6		109.0	117.7	+ 8
Subtotal	53.9	5.4	32.6	33.2		117.0	125.1	+ 7
Total ducks	135.6	146.0	149.5	247.7		813.0	678.8	-16
Canada geese	9.7	1.3	4.3	1.5		27.0	16.8	-38
Coots	--	15.2	--	0.9		17.0	16.1	- 5

[1] This area not surveyed in 1964: deleted for purposes of direct comparison.

TABLE B-49. --Duck production indexes, northern Saskatchewan, northern Manitoba, and western Ontario, 1955 to 1965

[Index numbers in thousands]

Year	Stratum					Total
	Ontario[1]	Manitoba		Saskatchewan		
	C	C	D	C South	C North	
Number of young:[2] 1965	--	12	12	50	160	234
Late nesting index:[3] 1965	--	32	55	42	44	173

[1] Not surveyed in 1965.

[2] Number of broods multiplied by average brood size.

[3] As indicated by pairs and single drakes.

TABLE B-50. --Duck broods, by age, class and stratum - northern Saskatchewan, northern Manitoba, and western Ontario, 1964 and 1965

Year and age class	Stratum					Total broods	Percent
	Ontario[1]	Manitoba		Saskatchewan			
	C	C	D	C South	C North		
1964:							
Class I	5	3	21	14	3	49	11
Class II	26	50	98	104	14	292	71
Class III	4	21	13	25	9	72	18
1965:							
Class I	--	2	2	6	3	13	16
Class II	--	2	14	20	13	49	61
Class III	--	1	3	7	7	18	23

[1] Ontario not surveyed in 1965.

TABLE B-51. --Production survey indexes by area, northern Saskatchewan, northern Manitoba, western Ontario, July 1965

Species	Ontario	Manitoba (C)	Manitoba (D-1)	Manitoba (D-2)	Saskatchewan S. of 55°30'N.	Saskatchewan N. of 55° 30'N.	Totals
Ducks:							
Dabblers:							
Mallard	--	8,866	9,827	3,254	11,365	8,712	42,024
Black duck	--	--	590	--	--	2,918	3,508
Gadwall	--	--	1,769	168	594	--	2,531
Widgeon	--	1,092	1,769	1,467	3,011	--	7,339
Green-winged teal	--	--	314	168	594	--	1,076
Blue-winged teal	--	--	2,988	321	1,187	--	4,496
Shoveler	--	--	1,769	642	--	--	2,411
Pintail	--	--	2,083	489	1,187	--	3,759
Subtotal	--	9,958	21,109	6,509	17,938	11,630	67,144
Divers:							
Redhead	--	--	2,083	1,299	594	--	3,976
Canvasback	--	1,092	1,494	168	--	--	2,754
Scaup	--	7,775	7,744	3,575	8,948	2,918	30,960
Ring-necked duck	--	8,866	2,987	2,597	8,354	14,505	37,309
Goldeneye	--	--	314	--	--	--	314
Bufflehead	--	2,216	--	--	597	2,918	5,728
Ruddy duck	--	--	2,398	642	--	--	3,040
Subtotal	--	19,949	17,020	8,281	18,493	20,341	84,081
Miscellaneous:							
Scoter	--	--	--	--	--	--	--
Merganser	--	2,216	1,179	489	5,980	11,586	21,450
Subtotal	--	2,216	1,179	489	5,980	11,586	21,450
Total ducks	--	32,123	39,308	15,279	42,411	43,557	172,675
Canada geese	--	--	--	--	--	--	--
Coots	--	--	3,373	325	2,091	--	5,789
Total		32,123	42,681	15,604	44,502	43,557	178,464

TABLE B-52. Long-term trend in pond indexes by strata and comparisons to average and previous year, southern Manitoba, May and July, 1965.

[Indexes in thousands]

Year	Stratum		Total
	A	B	A and B
May:			
1954	258	428	686
1955	315	428	743
1956	391	615	1,006
1957	262	404	666
1958	352	264	616
1959	160	482	642
1960	324	295	619
1961	158	263	421
1962	135	295	430
1963	298	331	629
1964	398	331	729
1965	327	478	805
Average 1954 through 1964	277	376	653
Percent change:			
1965 from 1964	-18	+44	+10
1965 from 1954-1964 average	+18	+27	+23
July:			
1954	473	384	857
1955	339	271	610
1956	425	411	836
1957	241	260	501
1958	163	341	504
1959	96	325	420
1960	164	212	376
1961	41	86	129
1962	97	135	232
1963	145	178	323
1964	201	182	383
1965	129	260	389
Average 1954 through 1964	217	253	470
Percent change:			
1965 from 1964	-36	+43	+02
1965 from 1954-1964 average	-41	+03	-17

TABLE B-53.--Comparative status of waterfowl breeding population indexes by species and stratum southern Manitoba, 1965

Species	1965 Stratum		Totals (Strata A and B)		Average 1953 to 1964	1965 Percent Change from	
	A	B	1964	1965		1964	12-Year average
Ducks:							
Dabblers:							
Mallard	71,800	75,200	167,000	147,000	296,200	- 12	- 50
Black duck	--	--	200	--	200	--	--
Gadwall	7,100	900	10,800	8,000	8,000	- 26	0
Widgeon	12,200	11,000	20,000	23,200	22,500	+ 16	+ 3
Green-winged teal	2,500	600	300	3,100	3,500	+933	- 11
Blue-winged teal	20,300	12,200	38,200	32,500	73,600	- 14	- 56
Shoveler	17,100	15,100	38,000	32,200	29,900	- 15	+ 8
Pintail	24,600	26,600	41,600	51,200	73,900	+ 23	- 31
Wood duck	--	--	--	--	--	--	--
Subtotal	155,600	141,600	316,100	297,200	507,800	- 6	- 41
Divers:							
Redhead	20,000	25,400	31,900	45,400	21,500	+ 42	+111
Canvasback	18,800	21,900	38,000	40,700	31,300	+ 7	+ 30
Scaup	40,100	27,000	72,300	67,100	74,500	- 7	- 10
Ring-necked duck	600	2,300	1,800	2,900	4,400	+ 61	- 34
Goldeneye	300	3,400	1,800	3,700	3,800	+106	- 3
Bufflehead	2,000	5,800	3,900	7,800	3,500	+100	+123
Ruddy duck	7,500	6,100	11,600	13,600	9,500	+ 17	+ 43
Subtotal	89,300	91,900	161,300	181,200	148,500	+ 12	+ 22
Miscellaneous:							
Merganser	300	2,900	4,000	3,200	400	- 20	+700
Scoter	500	500	600	1,000	500	+ 67	+100
Subtotal	800	3,400	4,600	4,200	900	- 9	+367
Total ducks:	245,700	236,900	482,000	482,600	657,200	No change	- 27
Geese:							
Canada goose	--	--	--	--	--	--	--
Coots:	21,400	14,900	56,200	36,300	56,300	- 35	- 35
Grand Total	267,100	251,800	538,200	518,900	713,500	- 5	- 27

TABLE B-54. --Waterfowl brood and late-nesting indexes by stratum compared to previous year, and long-term average, southern Manitoba, 1965.

[Index numbers in thousands]

Species	1965 Stratum		Totals Strata A and B Combined		Average 1954 - 1964	Percent change from:	
	A	B	1965	1964		1964	11-Year average
Broods:							
Duck brood index---	4.4	17.3	21.7	25.2	33.7	- 14	- 36
Average brood size[1]	5.2	5.7	5.6	5.0	5.6	+ 12	same
Coot brood index ---	4.6	11.2	15.8	12.8	7.7	+ 23	+105
Late nesting index[2]							
Dabblers:							
Mallard ----------	8.2	4.0	12.2	9.0	15.8	+ 36	- 23
Gadwall ----------	1.1	--	1.1	.7	1.2	+ 57	- 08
Baldpate ---------	1.1	4.0	5.1	1.2	3.0	+325	+ 70
Green-winged teal-	.2	.7	.9	.1	.5	+800	+ 80
Blue-winged teal --	2.3	--	2.3	5.3	7.6	- 57	- 70
Shoveler ---------	1.3	--	1.3	5.5	1.3	- 76	same
Pintail ----------	.7	--	.7	.3	2.3	+133	- 70
Subtotal -------	14.9	8.7	23.6	22.1	31.7	+ 07	- 26
Divers:							
Redhead----------	.3	.7	1.0	1.8	1.5	- 44	- 33
Canvasback--------	.4	--	.4	.3	1.1	+ 33	- 64
Scaup ----------	2.0	1.4	3.4	2.5	3.3	+ 36	+ 03
Ring-necked duck --	.1	--	.1	--	.7	+	- 86
Goldeneye ---------	--	--	--	.1	.3	--	--
Bufflehead---------	.1		.1	.1	.4	same	- 75
Ruddy duck --------	3.6	1.4	5.0	6.3	5.0	- 21	same
Subtotal -------	6.5	3.5	10.0	11.1	12.3	- 10	- 19
Miscellaneous ducks -	.2	--	.2	.1	.2	+100	same
Total ---------	21.6	12.2	33.8	33.3	44.2	+ 02	- 24

[1] Class II and III broods only.
[2] As indicated by adult pairs and singles.

TABLE B-55. --Waterfowl population summary, southern Manitoba, July 1965

	Stratum A	Stratum B	Strata A and B
Area in square miles	10,368	28,600	38,968
Linear miles in sample	1,578	636	2,214
Square miles in waterfowl sample	197.25	79.5	276.75
Expansion factor	52.563	359.75	--
Broods:			
Broods seen	83	48	131
Brood indexes	4,400	17,300	21,700
Broods per sq. mile	.4	.6	.56
Late nesters:			
Late nesters seen	411	34	445
Late nesting index	21,600	12,200	33,800
Late nesters per sq. mile	2.1	.4	.87
Coots:			
Coot broods seen	87	31	118
Coot brood index	4,600	11,200	15,800
Coot broods per sq. mile	.4	.4	.41
Ponds:			
Ponds seen	2,457	722	3,179
Pond index	129,100	259,700	388,800
Ponds per sq. mile	12.5	9.1	10.0

TABLE B-56. --Species breeding composition, Michigan, 1962 to 1965

Species	1962	1963	1964	1965
Mallard	32.8	37.1	28.0	39.2
Black duck	27.4	26.0	24.0	26.6
Blue-winged teal	12.2	11.6	13.7	7.6
Wood duck	8.9	10.4	13.0	9.2
Ring-necked duck	10.9	8.8	10.2	2.5
Merganser	4.4	3.5	2.4	3.2
Unidentified	3.4	2.6	8.7	11.7
Total	100.0	100.0	100.0	100.0

TABLE B-57.--Duck production index, Michigan, 1964 and 1965

Year	Number per lineal mile			Average brood size
	Broods	Hens and young	Lone drakes	
1964	0.80	5.83	8.77	5.76
1965	1.15	8.22	14.01	6.11

TABLE B-58.--Duck breeding population index, Michigan, 1964 and 1965

Year	Lineal miles censused	Potential breeders per lineal mile	
		Wood duck	All species
1964	137.4	1.60	17.09
1965	87.1	1.36	15.22

TABLE B-59.—Waterfowl brood indexes, Wisconsin, 1964 and 1965

Species	Number of broods		Number of young		Average young per brood	
	1964	1965	1964	1965	1964	1965
Mallard	62	47	420	318	6.8	6.8
Blue-winged teal	23	79	155	488	6.7	6.2
Wood duck	36	13	232	78	6.4	6.0
Other species	32	21	239	144	7.5	6.9

TABLE B-60.--Wood duck broods observed by stream and age class, Indiana, 1965

Stream	Miles of transect	Number of broods Age class			Total number of broods		Percent change from 1964
		I	II	III	1964	1965	
Maumee	15	6	6	--	9	12	+ 33
Big Blue	12	5	3	--	2	8	+300
Mascatatuck	19	13	19	3	6	35	+483
Salt Creek	15	9	4	2	12	15	+ 25
Total	61	33	32	5	29	70	+141

TABLE B-61.--Wood duck nesting effort and production data
Missouri, 1964 and 1965

	1964	1965	Percent change from-- 1964-1965
Lake and marsh censused (acres) -----	10,955	7,020	-35.9
Stream censused (miles) ----------	730	557	-23.69
Wood duck:			
Nesting effort:			
Per square mile of lake and stream -	6.0	10.9	+81.7
Per mile of stream ----------	.30	.32	+ 6.67
Number of broods (stream) -------	105	96	- 8.57
Broods per mile (stream) --------	.14	0.17	+21.4
Number of broods (marsh) ---------	25	13	-48.0
Broods per square mile (marsh) ----	1.5	1.19	-20.66
Average number of ducklings:			
Class I ----------	6.5	6.28	- 3.38
Class II ----------	5.5	5.3	- 2.46
Class III ----------	4.2	5.4	+28.09
All classes ----------	5.4	5.6	+ 3.88
Mallards and blue-winged teal:			
Nesting effort:			
Per square mile of lake and marsh --	2.4	1.3	-45.8
Per mile of stream ----------	.02	.055	+180.

TABLE B-62.--Number of water bodies, southwest Manitoba, 1964 and 1965

Area	1964	1965	Percent change from- 1964-1965
Streams ----------	45	63	+40
Dugouts ----------	52	39	-25
Field (sheet) water ----------	344	225	-35
Other ----------	1,647	1,307	-21
Total ----------	2,088	1,634	-26
Water areas (per sq. mi.)-----	26.9	20.7	

TABLE B-63. --Waterfowl breeding population, southwest Manitoba, May 1964 and 1965

Species	1964	1965	Percent change 1964-65
Ducks:			
Dabblers:			
Mallard	375	260	-31
Gadwall	92	59	-36
Widgeon	75	41	-45
Green-winged teal	35	26	-26
Blue-winged teal	651	309	-53
Shoveler	243	92	-62
Pintail	239	171	-29
Subtotal	1,710	958	-44
Divers:			
Redhead	107	60	-44
Canvasback	99	95	-4
Scaup	70	27	-61
Ring-necked duck	19	13	-32
Goldeneye	14	2	-86
Bufflehead	4	5	--
Ruddy duck	34	20	-41
Subtotal	347	222	-36
Unidentified ducks	4	--	--
Total ducks	2,061	1,180	-43

TABLE B-64. --Comparison of total broods observed on eight DU Projects, southwest Manitoba, July and August, 1963 to 1965

Area	1963	1964	1965
Ballantyne	27	12	11
Bone Lake	26	22	15
Jane	17	11	1
Johnston	24	6	11
Kelly Lake	8	1	1
Mac	59	12	13
Bars Lake	14	24	4
Total	175	88	56

TABLE B-65. --Waterfowl breeding population, Alberta, 1964 and 1965

Species	Total		Percent change from 1964
	1964	1965	
Ducks:			
Dabblers:			
Mallard	1,146	1,080	-5
Gadwall	292	308	+5
Widgeon	360	381	+5
Blue-winged and cinnamon teal	617	487	-20
Green-winged teal	131	93	-29
Shoveler	432	482	+11
Pintail	579	1,189	+105
Subtotal	3,557	4,020	
Divers:			
Redhead	163	147	-10
Canvasback	143	151	+5
Scaup	667	802	+20
Ring-necked duck	--	1	--
Goldeneye	11	16	--
Bufflehead	23	33	--
Ruddy duck	90	112	+24
Subtotal	1,097	1,262	
Miscellaneous:			
Scoter	32	8	--
Unidentified	1	6	--
Total ducks	4,687	5,296	
Water areas (per sq. mi.)	5.6	10.1	

TABLE B-66. --Waterfowl breeding population, Saskatchewan, 1964 and 1965

Species	Total		Percent change from 1964
	1964	1965	
Ducks:			
Dabblers:			
Mallard	603	319	-47
Gadwall	95	81	-15
Widgeon	151	95	-37
Green-winged teal	15	14	--
Blue-winged teal	257	166	-35
Shoveler	209	172	-18
Pintail	314	290	-8
Subtotal	1,644	1,137	
Divers:			
Redhead	49	25	-49
Canvasback	50	47	-6
Scaup	101	86	-15
Ring-necked duck	--	8	--
Goldeneye	--	--	--
Ruddy duck	--	8	--
Subtotal	200	174	
Unidentified	12	14	--
Total ducks	1,856	1,325	-29
Water areas (per sq. mi.)	7.0	12.5	+79

TABLE C-1. --Total duck and coot kill in the Pacific Flyway during the 1963 and 1964 hunting seasons (retrieved kill estimates adjusted for response bias and kill by junior hunters)

Species[1]	1963	1964	Percent change
Ducks:			
Dabblers:			
Mallard	896,400	968,700	+ 8
Domestic mallard	300	400	+33
Black X mallard	--	100	++
Gadwall	100,900	86,400	-14
American widgeon	328,300	289,800	-12
Green-winged teal	379,500	328,600	-13
Blue-winged and cinnamon teal	95,300	64,800	-32
Shoveler	257,400	112,200	-56
Pintail	587,200	452,200	-23
Wood duck	16,300	24,500	+50
Divers:			
Redhead	8,500	29,000	(2)
Canvasback	500	13,800	(2)
Greater scaup	10,700	7,600	-29
Lesser scaup	28,400	26,200	-8
Ring-necked duck	16,100	17,700	+10
Goldeneye	18,200	23,200	+27
Bufflehead	27,400	30,300	+11
Ruddy duck	35,300	23,100	-35
Miscellaneous:			
Common and red-breasted merganser	1,300	2,500	+92
Hooded merganser	1,000	1,100	+10
Oldsquaw	--	--	--
Scoter	800	600	-25
Others and unknown	--	300	++
Total ducks:			
Retrieved	2,807,300	2,502,900	-11
Not retrieved	557,000	530,600	-5
Ducks killed	3,364,300	3,033,500	-10
Coots:			
Retrieved	72,900	99,000	+36
Not retrieved	53,000	66,100	+25
Coots killed	125,900	165,200	+31

[1]Species composition derived from the 1963 and 1964 duck wing surveys.

[2]Season closed on redhead and canvasback in 1963.

TABLE C-2. --Total goose kill in the Pacific Flyway during the 1963 and 1964 hunting seasons (retrieved kill estimates adjusted for response bias and kill by junior hunters)

Species[1]	1963	1964	Percent change
Canada goose[2]	183,800	162,500	-12
Snow goose	67,200	66,600	- 1
Blue goose	--	900	++
White-fronted goose	69,100	57,500	-17
Black brant	11,200	5,100	-54
Total geese:			
Retrieved	331,200	292,600	-12
Not retrieved	64,800	61,900	- 4
Geese killed	396,000	354,400	-11

[1]Species composition derived from the 1963 and 1964 goose tail surveys.

[2]Includes all subspecies.

TABLE C-3.--Waterfowl hunting activity and bags of ducks and geese in the Pacific Flyway during the 1964 hunting season, with 1963 season comparisons

[Estimates unadjusted for response bias]

Hunting season	Duck bag limit	Days in duck season	Potential adult hunters	Hunter-days		Duck bag		Goose bag	
				Days per potential adult hunter	State [1] total	Seasonal bag per potential adult hunter	State [1] total	Seasonal bag per potential adult hunter	State [1] total
Arizona:									
1963----------	5-5	90	7,280	4.26	33,700	4.68	35,800	0.21	1,600
1964----------	5-5	90	8,310	5.64	50,900	6.18	53,900	0.34	2,900
Percent change --	--	--	+ 14	+ 32	+ 51	+ 32	+ 51	+ 62	+ 81
California:									
1963----------	6-6	75	135,980	6.05	894,200	13.16	1,879,100	1.88	267,800
1964----------	6-6	75	133,940	6.01	875,200	11.12	1,563,300	1.60	223,400
Percent change --	--	--	- 2	- 1	- 2	- 16	- 17	- 15	- 17
Colorado: [2]									
1963----------	4-8	90	2,860	3.76	11,700	5.02	15,100	0.02	100
1964----------	4-8	90	2,860	6.51	20,200	4.28	22,600	0.09	300
Percent change --	--	--	--	+ 73	+ 73	- 15	+ 50	+350	+200
Idaho:									
1963----------	5-5	93	23,650	6.46	166,100	12.36	306,900	0.87	21,500
1964----------	5-5	90	25,150	6.25	170,800	12.06	318,400	0.67	17,600
Percent change --	--	--	+ 6	- 3	+ 3	- 2	+ 4	- 23	- 18
Montana: [2]									
1963----------	5-10	75	6,600	5.17	37,100	7.31	50,600	0.23	1,600
1964----------	4-8	90	6,360	8.18	56,500	5.78	38,600	0.44	2,900
Percent change --	--	--	- 4	+ 58	+ 52	- 21	- 24	+ 91	+ 81

See footnotes p. 92

TABLE C-3.--Waterfowl hunting activity and bags of ducks and geese in the Pacific Flyway during the 1964 hunting season, with 1963 season comparisons--continued

[Estimates unadjusted for response bias]

Hunting season	Duck bag limit	Days in duck season	Potential adult hunters	Hunter-days		Duck bag		Goose bag	
				Days per potential adult hunter	State [1] total	Seasonal bag per potential adult hunter	State [1] total	Seasonal bag per potential adult hunter	State [1] total
Nevada:									
1963----------	4-8	87	8,760	5.54	52,700	8.34	76,600	0.66	6,100
1964----------	5-10	75	9,620	6.48	67,800	9.98	100,800	1.33	13,400
Percent change --	--	--	+ 10	+ 17	+ 29	+ 20	+ 32	+102	+120
New Mexico: [2]									
1963----------	4-8	86	870	4.20	4,000	6.02	5,500	0.00	0
1964----------	5-10	75	900	8.91	8,700	4.06	3,800	1.56	1,500
Percent change --	--	--	+ 3	+112	+118	- 33	- 31	++	++
Oregon:									
1963----------	4-8	90	43,770	5.34	254,200	6.63	304,700	1.08	49,600
1964----------	4-8	90	43,300	4.82	227,100	6.44	292,600	1.04	46,800
Percent change --	--	--	- 1	- 10	- 11	- 3	- 4	- 4	- 6
Utah:									
1963----------	5-5	90	24,990	6.03	163,900	11.58	303,900	0.39	10,200
1964----------	5-5	90	25,600	5.34	148,500	7.95	213,700	0.32	8,600
Percent change --	--	--	+ 2	- 11	- 9	- 31	- 30	- 18	- 16
Washington:									
1963----------	4-8	86	65,990	5.96	427,600	8.16	565,300	0.43	29,400
1964----------	4-8	90	63,880	5.66	393,200	8.20	549,700	0.37	24,800
Percent change --	--	--	- 3	- 5	- 8	+ 1	- 3	- 14	- 16

See footnotes p. 92

TABLE C-3.--Waterfowl hunting activity and bags of ducks and geese in the Pacific Flyway during the 1964 hunting season, with 1963 season comparisons--continued

[Estimates unadjusted for response bias]

Hunting season	Duck bag limit	Days in duck season	Potential adult hunters	Hunter-days		Duck bag		Goose bag	
				Days per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total
Wyoming:[2]									
1963----------	4-8	88	1,360	3.88	5,700	8.51	12,100	0.78	1,100
1964----------	5-10	75	1,390	4.96	7,500	8.74	12,800	0.99	1,400
Percent change ---	--	--	+ 2	+ 28	+ 32	+ 3	+ 6	+ 27	+ 27
Flyway total:									
1963----------	--	--	322,100	5.86	2,051,000	10.52	3,555,600	1.16	388,900
1964----------	--	--	321,300	5.80	2,026,500	9.36	3,170,200	1.02	343,600
Percent change ---	--	--	-0.2	- 1	- 1	- 11	- 11	- 12	- 12

[1] State totals include junior hunter estimates.

[2] State's hunting activity and bag west of Continental Divide.

TABLE C-4. --Numbers of duck stamps sold, proportion sold to philatelists and conservationists (non-hunters), estimated numbers of potential adult hunters and proportion active

State	1963 -- Full year sales				1964 -- Full year sales			
	Total duck stamp sales	Percent sold to non-hunters	Number of potential adult hunters	Percent active	Total duck stamp sales	Percent sold to non-hunters	Number of potential adult hunters	Percent active
Pacific Flyway:								
Arizona	7,418	1.82	7,279	66	8,432	1.49	8,306	76
California	136,961	0.72	135,975	82	135,419	1.08	133,943	84
Colorado[1]	2,884	0.85	2,860	76[2]	2,877	0.61	2,859	88
Idaho	23,794	0.61	23,649	81	25,266	0.45	25,152	81
Montana[1]	6,643	0.67	6,598	72[2]	6,397	0.56	6,361	83
Nevada	8,797	0.48	8,755	79	9,639	0.16	9,624	79
New Mexico[1]	875	0.76	868	86[2]	896	0.00	896	86
Oregon	44,020	0.58	43,765	76	43,702	0.91	43,304	74
Utah	25,114	0.50	24,988	90	25,621	0.07	25,603	89
Washington	66,422	0.65	65,990	75	64,262	0.60	63,876	76
Wyoming[1]	1,362	0.33	1,358	71[2]	1,435	2.93	1,393	81
Flyway total	324,290	0.63	322,085	80	323,946	0.77	321,317	80
U. S. total	1,431,186	0.81	1,419,785	78	1,554,419	0.78	1,542,558	82

[1] Portions lying west of Continental Divide.
[2] Figures for east and west portions of State combined.

TABLE C-5. --Total duck and coot kill in the Central Flyway during the 1963 and 1964 hunting seasons (retrieved kill estimates adjusted for response bias and kill by junior hunters)

Species [1]	1963	1964	Percent change
Ducks:			
Dabblers:			
Mallard	403,200	526,500	+ 31
Domestic mallard	100	100	--
Black duck	900	400	- 56
Black X mallard	300	100	- 67
Mottled duck	18,400	27,700	+ 51
Gadwall	117,000	108,200	- 8
American widgeon	76,900	104,300	+ 36
Green-winged teal	122,300	166,600	+ 36
Blue-winged and cinnamon teal	43,400	28,800	- 34
Shoveler	44,300	44,600	+ 1
Pintail	102,100	122,100	+ 20
Wood duck	18,100	23,100	+ 28
Divers:			
Redhead	3,800	33,500	(2)
Canvasback	300	13,800	(2)
Greater scaup	800	1,200	+ 50
Lesser scaup	37,400	40,800	+ 9
Ring-necked duck	14,100	34,000	+141
Goldeneye	2,000	3,600	+ 80
Bufflehead	4,200	8,900	+112
Ruddy duck	1,900	2,300	+ 21
Miscellaneous:			
Common and red-breasted merganser	200	1,800	+800
Hooded merganser	1,700	2,200	+ 29
Scoter	--	500	++
Others and unknown	100	400	+300
Total ducks:			
Retrieved	1,013,800	1,295,400	+ 28
Not retrieved	253,300	315,000	+ 24
Ducks killed	1,267,100	1,610,400	+ 27
Coots:			
Retrieved	21,600	23,200	+ 7
Not retrieved	9,800	17,600	+ 80
Coots killed	31,300	40,800	+ 30

[1] Species composition derived from the 1963 and 1964 duck wing surveys.
[2] Season closed on redhead and canvasback in 1963.

TABLE C-6.--Total goose kill in the Central Flyway during the 1963 and 1964 hunting seasons (retrieved kill estimates adjusted for response bias and kill by junior hunters)

Species[1]	1963	1964	Percent change
Canada goose[2]	113,100	128,100	+13
Snow goose	86,300	80,000	- 7
Blue goose	33,300	25,200	-24
White-fronted goose	29,700	24,200	-19
Brant	200	--	--
Total geese:			
Retrieved	262,700	257,500	- 2
Not retrieved	46,500	43,500	- 6
Geese killed	309,200	300,900	- 3

TABLE C-7.--Waterfowl hunting activity and bags of ducks and geese in the Central Flyway during the 1964 hunting season, with 1963 season comparisons

[Estimates unadjusted for response bias]

Hunting season	Duck bag limit	Days in duck season	Potential adult hunters	Hunter-days		Duck bag		Goose bag	
				Days per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total
Colorado:[3]									
1963----------	4-8	35	20,040	4.63	100,700	4.00	84,900	0.54	11,400
1964----------	4-8	40	23,260	4.34	109,500	3.14	77,400	0.57	13,700
Percent change ---	--	--	+ 16	- 6	+ 9	- 22	- 9	+ 6	+ 20
Kansas:									
1963----------	4-8	35	28,620	5.10	158,600	3.90	118,500	0.33	9,800
1964----------	4-8	36	27,610	5.81	174,200	5.27	154,400	0.71	20,300
Percent change ---	--	--	- 4	+ 14	+ 10	+ 35	+ 30	+115	+107
Montana:[3]									
1963----------	4-8	35	13,450	3.93	57,300	3.76	53,600	0.43	6,000
1964----------	4-8	40	14,410	4.13	64,600	4.34	66,400	0.43	6,400
Percent change ---	--	--	+ 7	+ 5	+ 13	+ 15	+ 24	--	+ 7
Nebraska:									
1963----------	4-8	32[2]	26,280	5.01	144,200	4.98	138,900	0.58	15,800
1964----------	4-8	36[2]	28,560	5.30	164,400	6.00	181,800	0.43	12,900
Percent change ---	--	--	+ 9	+ 6	+ 14	+ 20	+ 31	- 26	- 18
New Mexico:[3]									
1963----------	4-8	35	4,600	5.75	28,700	6.52	31,800	0.59	2,800
1964----------	4-8	40	4,190	4.68	21,300	4.91	21,800	0.09	400
Percent change ---	--	--	- 9	- 19	- 26	- 25	- 31	- 85	- 86

See footnotes p. 97

TABLE C-7.--Waterfowl hunting activity and bags of ducks and geese in the Central Flyway during the 1964 hunting season, with 1963 season comparisons--continued

[Estimates unadjusted for response bias]

Hunting season	Duck bag limit	Days in duck season	Potential adult hunters	Hunter-days		Duck bag		Goose bag	
				Days per potential adult hunter	State [1] total	Seasonal bag per potential adult hunter	State [1] total	Seasonal bag per potential adult hunter	State [1] total
North Dakota:									
1963	4-8	35	36,320	6.03	237,800	5.89	226,700	1.41	53,400
1964	4-8	40	38,980	6.58	278,500	6.94	287,000	1.38	55,800
Percent change	--	--	+ 7	+ 9	+ 17	+ 18	+ 27	- 2	+ 4
Oklahoma:									
1963	4-8	35	20,000	4.25	92,200	2.35	49,900	0.72	14,900
1964	4-8	33 [2]	21,700	5.39	127,000	5.20	119,600	0.34	7,600
Percent change	--	--	+ 9	+ 27	+ 38	+121	+140	- 53	- 49
South Dakota:									
1963	4-8	35	36,200	6.05	237,900	7.46	286,400	1.27	48,000
1964	4-8	40	34,570	6.35	238,400	5.95	218,200	1.29	46,400
Percent change	--	--	- 5	+ 5	+0.2	- 20	- 24	+ 2	- 3
Texas:									
1963	4-8	35	73,570	4.34	346,300	4.70	366,900	1.82	139,700
1964	4-8	40	82,940	4.86	437,900	6.83	600,700	1.53	132,300
Percent change	--	--	+ 13	+ 12	+ 26	+ 45	+ 64	- 16	- 5
Wyoming: [3]									
1963	4-8	35	3,520	4.09	15,600	3.77	14,100	0.26	900
1964	4-8	36 [2]	4,180	4.25	19,300	5.78	25,600	0.15	600
Percent change	--	--	+ 19	+ 4	+ 24	+ 53	+ 82	- 42	- 33
Flyway total:									
1963	--	--	262,600	4.98	1,419,500	4.93	1,371,800	1.11	302,500
1964	--	--	280,400	5.38	1,635,000	5.90	1,752,900	1.01	296,500
Percent change	--	--	- 7	+ 8	+15	+ 20	+28	- 9	- 2

[1] State totals include junior hunter estimates.
[2] Indicates split season.
[3] State's hunting activity and bag east of Continental Divide.

TABLE C-8.--Numbers of duck stamps sold, proportion sold to philatelists and conservationists (non-hunters), estimated numbers of potential adult hunters and proportion active--continued

State	1963--Full year sales				1964--Full year sales			
	Total duck stamp sales	Percent sold to non-hunters	Number of potential adult hunters	Percent active	Total duck stamp sales	Percent sold to non-hunters	Number of potential adult hunters	Percent active
Central Flyway:								
Colorado[1] -------	20,208	0.85	20,036	76[2]	23,398	0.61	23,255	79
Kansas ----------	28,797	0.60	28,624	71	27,801	0.69	27,609	82
Montana[1] --------	13,541	0.67	13,451	72[2]	14,495	0.56	14,414	79
Nebraska --------	26,531	0.94	26,282	79	28,732	0.60	28,560	80
New Mexico[1] ----	4,632	0.76	4,597	86[2]	4,192	0.00	4,192	87
North Dakota -----	36,502	0.50	36,319	81	39,120	0.36	38,979	84
Oklahoma --------	20,098	0.50	19,998	74	21,787	0.42	21,695	80
South Dakota -----	36,359	0.43	36,203	79	34,668	0.28	34,571	79
Texas ----------	73,973	0.55	73,566	73	83,442	0.60	82,941	78
Wyoming[1] -------	3,528	0.33	3,516	71[2]	4,309	2.93	4,183	76
Flyway total	264,169	0.63	262,592	76	281,944	0.58	280,399	80

[1]Portions lying east of Continental Divide.
[2]Figures for east and west portions of State combined.

TABLE C-9. --Total duck and coot kill in the Mississippi Flyway during the 1963 and 1964 hunting seasons (retrieved kill estimates adjusted for response bias and kill by junior hunters)

Species [1]	1963	1964	Percent change
Ducks:			
Dabblers:			
Mallard	923,600	1,317,000	+ 43
Domestic mallard	4,400	1,900	- 57
Black duck	73,500	97,300	+ 32
Black X mallard	3,000	6,000	+100
Mottled and Florida duck	19,700	36,700	+ 86
Gadwall	109,000	147,100	+ 35
American widgeon	117,900	205,400	+ 74
Green-winged teal	163,700	288,200	+ 76
Blue-winged teal	196,900	175,100	- 11
Shoveler	43,300	58,000	+ 34
Pintail	108,500	163,600	+ 51
Wood duck	371,100	320,500	- 14
Divers:			
Redhead	4,300	48,200	([2])
Canvasback	200	37,400	([2])
Greater scaup	11,800	18,700	+ 58
Lesser scaup	189,000	244,100	+ 29
Ring-necked duck	123,100	301,500	+145
Goldeneye	7,600	19,700	+159
Bufflehead	17,100	34,400	+101
Ruddy duck	8,200	17,000	+107
Miscellaneous:			
Common and red-breasted merganser	2,100	3,300	+ 57
Hooded merganser	12,800	13,500	+ 5
Oldsquaw and eider	900	400	- 56
Scoter	1,800	4,200	+133
Others and unknown	500	1,100	+120
Total ducks:			
Retrieved	2,514,300	3,560,300	+ 42
Not retrieved	686,800	897,000	+ 31
Ducks killed	3,201,100	4,457,300	+ 39
Coots:			
Retrieved	222,300	286,300	+ 29
Not retrieved	61,100	84,800	+ 39
Coots killed	283,300	371,100	+ 31

[1] Species composition derived from the 1963 and 1964 duck wing surveys.

[2] Season closed on redhead and canvasback in 1963.

TABLE C-10. --Total goose kill in the Mississippi Flyway during the 1963 and 1964 hunting seasons (retrieved kill estimates adjusted for response bias and kill by junior hunters)

Species[1]	1963	1964	Percent change
Canada goose[2]	106,300	148,300	+40
Snow goose	19,000	22,800	+20
Blue goose	47,300	65,600	+39
White-fronted goose	7,800	11,500	+47
Unknown	--	1,400	++
Total geese:			
Retrieved	180,400	249,500	+38
Not retrieved	35,800	41,900	+17
Geese killed	216,300	291,300	+35

[1]Species composition derived from the 1963 and 1964 goose tail surveys.
[2]Includes all subspecies.

TABLE C-11. --Waterfowl hunting activity and bags of ducks and geese in the Mississippi Flyway during the 1964 hunting season, with 1963 season comparisons

[Estimates unadjusted for response bias]

Hunting season	Duck bag limit	Days in duck season	Potential adult hunters	Hunter-days		Duck bag		Goose bag	
				Days per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total
Alabama:									
1963	4-8	35	11,370	5.70	69,300	6.35	75,600	0.24	2,800
1964	4-8	40	13,810	5.20	76,900	4.00	57,800	0.36	5,100
Percent change	--	--	+ 21	- 9	+ 11	- 37	- 24	+ 50	+ 82
Arkansas:									
1963	4-8	35	18,280	5.48	107,100	8.82	168,800	0.08	1,500
1964	4-8	40	34,730	7.30	271,300	10.22	371,400	0.05	1,600
Percent change	--	--	+ 90	+ 33	+153	+ 16	+120	- 38	+ 7
Illinois:									
1963	4-8	35	52,140	5.09	283,700	4.29	234,300	0.35	18,700
1964	4-8	40	52,680	5.12	288,500	4.37	241,200	0.66	36,000
Percent change	--	--	+ 1	+ 1	+ 2	+ 2	+ 3	+ 89	+ 93
Indiana:									
1963	4-8	32[2]	16,760	3.61	64,700	1.32	23,100	0.10	1,700
1964	4-8	36[2]	16,650	4.99	88,900	2.83	49,200	0.34	5,900
Percent change	--	--	- 1	+ 38	+ 37	+114	+113	+240	+247
Iowa:									
1963	4-8	32[2]	36,810	6.21	244,500	4.86	187,200	0.64	24,400
1964	4-8	36[2]	37,430	6.33	253,500	6.60	258,400	0.49	18,900
Percent change	--	--	+ 2	+ 2	+ 4	+ 36	+ 38	- 23	- 23

See footnotes p. 103

TABLE C-11. --Waterfowl hunting activity and bags of ducks and geese in the Mississippi Flyway during the 1964 hunting season, with 1963 season comparisons--continued

[Estimates unadjusted for response bias]

Hunting season	Duck bag limit	Days in duck season	Potential adult hunters	Hunter-days		Duck bag		Goose bag	
				Days per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total
Kentucky:									
1963	4-8	35	5,710	4.14	25,300	2.76	16,500	0.44	2,600
1964	4-8	40	7,120	5.88	44,800	4.58	34,100	0.57	4,200
Percent change	--	--	+ 25	+ 42	+ 77	+ 66	+107	+ 30	+ 62
Louisiana:									
1963	4-8	35	66,640	5.88	419,000	12.49	870,800	0.57	39,400
1964	4-8	40	86,040	6.67	613,700	13.09	1,178,900	0.76	67,300
Percent change	--	--	+ 29	+ 13	+ 46	+ 5	+ 35	+ 33	+ 71
Michigan:									
1963	4-8	35	69,660	4.36	325,100	2.34	170,800	0.23	16,200
1964	4-8	40	78,670	4.81	405,000	3.12	256,600	0.30	24,600
Percent change	--	--	+ 13	+ 10	+ 25	+ 33	+ 50	+ 30	+ 52
Minnesota:									
1963	3-6	35	111,250	5.27	627,400	6.36	741,000	0.20	22,700
1964	4-8	40	128,170	5.83	799,600	8.58	1,151,000	0.16	20,700
Percent change	--	--	+ 15	+ 11	+ 27	+ 35	+ 55	- 20	- 9
Mississippi:									
1963	4-8	35	13,320	5.11	72,800	8.03	112,000	0.07	900
1964	4-8	40	16,140	4.98	86,000	5.18	87,500	0.04	-700
Percent change	--	--	+ 21	- 3	+ 18	- 35	- 22	- 43	- 22

See footnotes p. 103

TABLE C-11. --Waterfowl hunting activity and bags of ducks and geese in the Mississippi Flyway during the 1964 hunting season, with 1963 season comparisons--continued

[Estimates unadjusted for response bias]

Hunting season	Duck bag limit	Days in duck season	Potential adult hunters	Hunter-days		Duck bag		Goose bag	
				Days per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total
Missouri									
1963	4-8	35	34,030	4.55	165,600	2.37	84,600	1.45	51,000
1964	4-8	40	38,180	4.79	195,800	3.61	144,400	1.14	45,000
Percent change	--	--	+ 12	+ 5	+ 18	+ 52	+ 71	- 21	- 12
Ohio:									
1963	4-8	32[2]	23,470	5.42	136,000	3.57	87,800	0.10	2,400
1964	4-8	36[2]	24,880	5.37	142,900	3.29	85,700	0.19	4,900
Percent change	--	--	+ 6	- 1	+ 5	- 8	- 2	+ 90	+104
Tennessee:									
1963	4-8	35	15,210	4.93	80,300	6.04	96,100	0.15	2,400
1964	4-8	40	21,560	5.75	132,700	6.27	141,300	0.20	4,400
Percent change	--	--	+ 42	+ 17	+ 65	+ 4	+ 47	+ 33	+ 83
Wisconsin:									
1963	4-8	35	93,720	5.15	516,600	3.76	369,200	0.27	25,900
1964	4-8	40	103,950	5.81	646,200	4.85	527,200	0.51	54,900
Percent change	--	--	+ 11	+ 13	+ 25	+ 29	+ 43	+ 89	+112
Flyway total:									
1963	--	--	568,400	5.16	3,137,400	5.44	3,237,700	0.36	212,800
1964	--	--	660,000	5.73	4,045,700	6.65	4,584,700	0.43	294,200
Percent change	--	--	+ 16	+ 11	+ 29	+ 22	+ 42	+ 19	+ 38

[1]State totals include junior hunter estimates.
[2]Indicates split season.

TABLE C-12. --Numbers of duck stamps sold, proportion sold to philatelist and conservationists (non-hunters), estimated numbers of potential adult hunters and proportion active--continued

State[1]	1963--Full year sales				1964--Full year sales			
	Total duck stamp sales	Percent sold to non-hunters	Number of potential adult hunters	Percent active	Total duck stamp sales	Percent sold to non-hunters	Number of potential adult hunters	Percent active
Mississippi Flyway:								
Alabama	11, 391	0. 23	11, 365	81	13, 824	0. 10	13, 810	83
Arkansas	18, 352	0. 40	18, 279	79	34, 838	0. 31	34, 730	86
Illinois	53, 125	1. 85	52, 142	77	53, 229	1. 03	52, 681	81
Indiana	16, 831	0. 40	16, 764	72	16, 945	1. 75	16, 648	84
Iowa	37, 222	1. 12	36, 805	81	37, 668	0. 64	37, 427	83
Kentucky	5, 725	0. 33	5, 706	80	7, 146	0. 30	7, 125	87
Louisiana	66, 672	0. 05	66, 639	80	86, 162	1. 14	86, 041	84
Michigan	70, 094	0. 62	69, 659	77	79, 268	0. 76	78, 666	81
Minnesota	111, 977	0. 65	111, 249	88	128, 764	0. 46	128, 172	91
Mississippi	13, 368	0. 40	13, 315	79	16, 221	0. 50	16, 140	76
Missouri	34, 265	0. 69	34, 029	80	38, 392	0. 53	38, 185	85
Ohio	23, 832	1. 54	23, 465	82	25, 178	1. 18	24, 883	82
Tennessee	15, 243	0. 20	15, 213	81	21, 616	0. 28	21, 555	88
Wisconsin	94, 213	0. 52	93, 723	81	104, 522	0. 55	103, 947	83
Flyway total	572, 310	0. 68	568, 353	81	663, 773	0. 61	660, 010	84

TABLE C-13. --Total duck and coot kill in the Atlantic Flyway during the 1963 and 1964 hunting seasons (retrieved kill estimates adjusted for response bias and kill by junior hunters)

Species[1]	1963	1964	Percent change
Ducks:			
Dabblers:			
Mallard	140,600	160,200	+ 14
Domestic mallard	3,200	1,500	- 53
Black duck	215,000	242,400	+ 13
Black X mallard	6,000	7,300	+ 22
Mottled and Florida duck	17,300	14,200	- 18
Gadwall	17,600	13,000	- 26
American widgeon	40,300	44,300	+ 10
Green-winged teal	61,600	86,200	+ 40
Blue-winged teal	21,000	18,600	- 11
Shoveler	8,000	8,100	- 8
Pintail	27,000	25,800	- 4
Wood duck	124,800	105,600	- 15
Divers:			
Redhead	1,400	9,800	(2)
Canvasback	300	26,700	(2)
Greater scaup	28,800	19,600	- 32
Lesser scaup	25,100	19,400	- 23
Ring-necked duck	68,500	69,300	+ 1
Goldeneye	16,900	20,000	+ 18
Bufflehead	18,700	23,100	+ 24
Ruddy duck	5,000	9,500	+ 90
Sea Ducks:			
Oldsquaw	8,600[3]	4,300	- 10
Eider	--	3,400	--
Scoter	27,300	38,500	+ 41
Miscellaneous:			
Common and red-breasted merganser	8,100	11,500	+ 42
Hooded merganser	15,600	11,500	- 26
Others and unknown	400	1,900	+375
Total ducks:			
Retrieved	908,100	995,400	+ 10
Not retrieved	230,500	246,700	+ 7
Ducks killed	1,138,600	1,242,200	+ 9
Coots:			
Retrieved	47,100	72,200	+ 53
Not retrieved	15,600	20,100	+ 29
Coots killed	62,700	92,300	+ 47

[1] Species composition derived from the 1963 and 1964 duck wing surveys.
[2] Season closed on redhead and canvasback in 1963.
[3] Oldsquaw and eider combined in 1963.

TABLE C-14.--Total goose kill in the Atlantic Flyway during the 1963 and 1964 hunting seasons (retrieved kill estimates adjusted for response bias and kill by junior hunters)

Species[1]	1963	1964	Percent change
Canada goose[2] --------	123,300	125,100	+ 1
Snow goose ----------	--	48	+
American brant--------	37,300	31,800	-15
Unknown ----------	--	2,100	++
Total geese:			
Retrieved ----------	160,600	159,000	- 1
Not retrieved --------	27,200	25,100	- 8
Geese killed ---------	187,800	184,200	- 2

[1]Species composition derived from the 1963 and 1964 goose tail surveys.
[2]Includes all subspecies.

TABLE C-15.--Waterfowl hunting activity and bags of ducks and geese in the Atlantic Flyway during the 1964 hunting season, with 1963 season comparisons

[Estimates unadjusted for response bias]

Hunting season	Duck bag limit	Days in duck season	Potential adult hunters	Hunter-days		Duck bag		Goose bag	
				Days per potential adult hunters	State[1] total	Seasonal bag per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total
Connecticut:									
1963----------	3-6	45[2]	7,660	4.10	33,000	2.39	22,400	0.12	900
1964----------	3-6	45[2]	7,650	4.23	34,000	3.12	26,000	0.17	1,300
Percent change ----	--	--	-0.1	+ 3	+ 3	+ 31	+ 16	+ 42	+ 44
Delaware:									
1963----------	3-6	45[2]	7,320	5.99	46,100	3.39	25,700	2.02	15,200
1964----------	3-6	50	7,730	8.12	66,000	4.29	34,800	2.76	21,800
Percent change ----	--	--	+ 6	+ 36	+ 43	+ 27	+ 35	+ 37	+ 43
Florida:									
1963----------	4-8	40	26,090	4.41	121,100	7.07	191,200	0.02	500
1964----------	4-8	40	25,850	4.16	113,100	5.57	154,500	0.05	1,300
Percent change ----	--	--	- 1	- 6	- 7	- 21	- 19	+150	+160
Georgia:									
1963----------	4-8	40	10,690	4.76	53,500	6.20	68,600	0.05	600
1964----------	4-8	40	7,690	3.94	31,900	3.72	29,900	0.08	600
Percent change ----	--	--	- 28	- 17	- 40	- 40	- 56	+ 60	--
Maine:									
1963----------	3-6	45[2]	9,930	4.58	47,800	3.74	48,400	0.06	600
1964----------	3-6	45[2]	10,880	4.69	53,600	4.96	67,900	0.04	400
Percent change ----	--	--	+ 10	+ 2	+ 12	+ 33	+ 40	- 33	+ 33

See footnotes p. 109

TABLE C-15.--Waterfowl hunting activity and bags of ducks and geese in the Atlantic Flyway during the 1964 hunting season, with 1963 season comparisons--continued

[Estimates unadjusted for response bias]

Hunting season	Duck bag limit	Days in duck season	Potential adult hunters	Hunter-days		Duck bag		Goose bag	
				Days per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total
Maryland:[3]									
1963	3-6	50	22,670	5.19	123,700	2.62	61,800	2.48	57,100
1964	3-6	50	25,080	6.23	160,200	3.94	102,000	2.54	64,000
Percent change	--	--	+ 11	+ 20	+ 30	+ 50	+ 65	+ 2	+ 12
Massachusetts:									
1963	3-6	45[2]	16,350	3.94	67,800	2.41	54,600	0.10	1,700
1964	3-6	45[2]	17,600	4.67	86,500	3.41	82,300	0.17	3,100
Percent change	--	--	+ 8	+ 19	+ 28	+ 42	+ 51	+ 70	+ 82
New Hampshire:									
1963	3-6	50	3,600	4.28	16,200	2.58	10,300	0.08	300
1964	3-6	50	4,690	6.04	29,800	3.62	20,000	0.10	500
Percent change	--	--	+ 30	+ 41	+ 84	+ 40	+ 94	+ 25	+ 67
New Jersey:									
1963	3-6	45[2]	22,060	5.25	121,800	4.39	100,300	1.50	33,800
1964	3-6	45[2]	21,910	5.72	131,800	4.53	104,800	1.66	37,300
Percent change	--	--	- 1	+ 9	+ 8	+ 3	+ 4	+ 11	+ 10
New York:									
1963	3-6	50	44,060	4.28	198,300	2.95	146,700	0.56	25,400
1964	3-6	50	53,210	4.46	249,500	2.93	174,500	0.44	23,900
Percent change	--	--	+ 21	+ 4	+ 26	- 1	+ 19	- 21	- 6
North Carolina:									
1963	3-6	50	23,880	4.46	112,000	2.92	72,200	1.32	32,200
1964	3-6	50	23,380	5.06	124,300	3.68	90,100	0.65	15,700
Percent change	--	--	- 2	+ 13	+ 11	+ 26	+ 25	- 51	- 51
Pennsylvania:									
1963	3-6	50	33,840	3.65	129,900	2.17	76,200	0.22	7,700
1964	3-6	50	37,440	4.92	193,600	2.34	90,600	0.26	10,100
Percent change	--	--	+ 11	+ 35	+ 49	+ 8	+ 19	+ 18	+ 31

See footnotes p. 109.

TABLE C-15.--Waterfowl hunting activity and bags of ducks and geese in the Atlantic Flyway during 1964 hunting season, with 1963 season comparisons--continued

[Estimates unadjusted for response bias]

Hunting season	Duck bag limit	Days in duck season	Potential adult hunters	Hunter-days		Duck bag		Goose bag	
				Days per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total	Seasonal bag per potential adult hunter	State[1] total
Rhode Island:									
1963----------	3-6	50	2,330	6.11	15,000	4.15	10,700	0.05	100
1964----------	3-6	50	2,200	5.48	12,700	3.99	9,800	0.07	100
Percent change --	--	--	- 6	-10	- 15	- 4	- 8	+ 40	--
South Carolina:									
1963----------	3-6	50	13,360	5.27	74,100	5.43	75,200	0.18	2,500
1964----------	4-8	40	12,980	5.44	74,300	5.07	68,900	0.05	600
Percent change --	--	--	- 3	+ 3	+0.3	- 7	- 8	- 72	- 76
Vermont:									
1963----------	3-6	45[2]	3,510	3.81	14,100	3.96	14,400	0.07	300
1964----------	3-6	50	4,180	5.77	25,300	6.35	25,600	0.27	1,100
Percent change --	--	--	+ 19	+51	+ 79	+ 60	+ 78	+286	+267
Virginia:[3]									
1963----------	3-6	50	17,970	4.07	76,800	3.44	63,600	1.09	20,600
1964----------	3-6	50	17,130	5.58	98,900	3.40	61,800	0.87	15,800
Percent change --	--	--	- 5	+37	+ 29	- 1	- 3	- 20	- 23
West Virginia:									
1963----------	3-6	45[2]	1,430	1.81	2,700	1.82	2,700	0.11	200
1964----------	3-6	45[2]	1,240	2.85	3,700	1.28	1,600	--	--
Percent change --	--	--	- 13	+57	+ 37	- 30	- 41	--	--
Flyway total:									
1963----------	--	--	266,800	4.47	1,254,200	3.63	1,044,600	0.73	199,700
1964----------	--	--	280,800	5.06	1,489,100	3.72	1,145,200	0.70	197,700
Percent change --	--	--	+ 5	+13	+ 19	+ 2	+ 10	- 4	- 1

[1]State totals include junior hunter estimates.
[2]Indicates split season.
[3]Portion of Washington, D. C., hunters and kill allocated to Virginia.

TABLE C-16.--Numbers of duck stamps sold, proportion sold to philatelists and conservationists (non-hunters), estimated numbers of potential adult hunters and proportion active

State	1963—Full year sales				1964—Full year sales			
	Total duck stamp sales	Percent sold to non-hunters	Number of potential adult hunters	Percent active	Total duck stamp sales	Percent sold to non-hunters	Number of potential adult hunters	Percent active
Atlantic Flyway:								
Connecticut	7,838	2.34	7,655	70	7,834	2.40	7,646	76
Delaware	7,347	0.40	7,318	77	7,815	1.05	7,733	85
District of Columbia	1,831	2.38	1,787	78	2,267	5.41	2,144	73
Florida	26,220	0.51	26.086	74	26,029	0.70	25,847	74
Georgia	10,700	0.13	10,686	76	7,732	0.51	7,693	78
Maine	10,080	1.51	9,928	77	10,997	1.11	10,875	80
Maryland	21,705	0.81	21,529	77	24,144	1.76	23,719	81
Massachusetts	16,607	1.55	16,353	68	18,255	3.57	17,603	78
New Hampshire	3,689	2.32	3,603	72	4,721	0.66	4,690	81
New Jersey	23,015	4.13	22,064	78	22,312	1.82	21,906	80
New York	44,726	1.48	44,064	61	53,917	1.31	53,211	70
North Carolina	23,972	0.71	23,802	75	23,479	0.80	23,291	84
Pennsylvania	34,191	1.02	33,842	79	37,855	1.10	37,439	84
Rhode Island	2,400	2.78	2,333	78	2,196	0.00	2,196	71
South Carolina	13,429	0.51	13,361	82	13,039	0.46	12,979	76
Vermont	3,564	1.49	3,511	73	4,292	2.70	4,176	83
Virginia	17,612	1.21	17,399	76	16,609	0.97	16,448	78
West Virginia	1,491	3.79	1,434	65	1,263	2.15	1,236	54
Flyway total	270,417	1.33	266,755	73	284,756	1.42	280,832	78

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